PICTURE Cave

UNRAVELING THE MYSTERIES OF THE MISSISSIPPIAN COSMOS

EDITED BY

Foreword by Patty Jo Watson

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FOREWORD

Patty Jo Watson

MY PERSONAL CONNECTION with Picture Cave began in 1990, when a local relic collector showed up at the Department of Anthropology, Washington University in St. Louis, talking excitedly about a cave out west of town that had yielded an Etley point and other artifactual remains. He was eager to show us the place, so George Crothers and I agreed to take a look at it. Crothers was then a graduate student in anthropology, specializing in cave and shell mound archaeology in West-Central Kentucky.

On the agreed-upon Saturday back in 1990, George and I drove to the rendezvous point, met our informant and guide, and duly checked out the cave. It was an impressive place, but had obviously been frequently and severely vandalized. Very little of the original deposit appeared to be intact, although there were several pictographs visible here and there on the cave walls. Those we could make out seemed to be late prehistoric, making me think of the Mississippian renderings at Mud Glyph Cave in Tennessee, which I had been shown by Charles Faulkner and his University of Tennessee research team during the early 1980s (Faulkner [ed.] 1986).

Discouraged by the seeming lack of in situ stratigraphy and the generally torn-up condition of the substrate in this Missouri cave, but thinking of the pictographs, George and I decided to tell Carol Diaz-Granados about the site. Carol was then, like George, a graduate student in my department, working on a dissertation concerning pictographs and petroglyphs throughout Missouri (Diaz-Granados 1993; Diaz-Granados and Duncan 2000). We turned the meager information over to her and went back to our own Archaic/Early Woodland research in caves, rockshelters, and shell mounds along the middle Green River, Kentucky (Marquardt and Watson [eds.] 2005).

In the 1990s, I had an attitude toward "rock art" manifested by many archaeologists at the time: it can't be dated directly, and there is usually little or no stratigraphic context for it; therefore, any detailed study of pictographs, petroglyphs, or mud glyphs requires heavy reliance on some form of stylistic analysis about which I knew nothing and for which I had zero aptitude—all this in spite of the big impression that Mud Glyph Cave had made on me, and in spite of the fact that I had quite recently been convinced that several small but very striking charcoal drawings in my own cave (Salts Cave, Mammoth Cave National Park, Kentucky; see Watson [ed.] 1969, 1974, 1997) were prehistoric (DiBlasi 1996).

At any rate, Carol added the Missouri cave to her long-term research on rock graphics in that state, making the appropriate assumption (contrary to mine in 1990) that this decorated cave could not only be adequately documented but also could be comprehended at various levels, from chronology to the nature and number of individual and grouped renderings to inferences about the cultural meanings of the pictographs. After establishing rapport with the landowner and various local caver groups affiliated with the National Speleological Society, Carol put together a strong research team (the Picture Cave Interdisciplinary Project) that carried out the studies described and discussed in this book. None of this work was easy, even by the usual standards of archaeology underground, and none of it was lavishly funded, but all of it was and is successful in ways that far exceed my most optimistic expectations.

Although Picture Cave may be the only decorated dark zone sandstone cave yet known, it is not unique in general geographic location (i.e., the Midwest) or in morphology and layout of underground space (as demonstrated by Simek in chapter 2 here). The image corpus and possible function of this cave are not without parallel, either, although the pictographs are quite unusual in quantity and quality. But

Picture Cave is certainly an outlier to what is known of cave art elsewhere in eastern North America and currently occupies a position somewhat like that of Cahokia or Chaco: so far beyond present knowledge of its comparanda as to be more than a little enigmatic. This situation may be wholly or largely due simply to general lack of information and accidents of sampling. After all, systematic cave archaeology of any kind and systematic rock art research in cave dark zones were both—until very recently—highly underdeveloped scholarly pursuits in eastern North America (Crothers, Watson et al. 2002; D. H. Dye 2008; Simek 2008; Simek et al. 2012).

Perhaps there are or were several comparable sites in rockshelters, on bluffs, and in other caves that have not survived weathering, erosion, and the impact of vandalism or inadvertent destruction resulting from ignorance or from unheeding traffic by hikers and picnickers. Nevertheless, it is now established that the indigenous inhabitants of eastern North America extensively explored the dark zones of many caves (in some cases, for multiple miles) at least as early as the third millennium BC (Watson 2012). Moreover, contrary to my own earlier opinions, it is clear that these ancient North American cavers regarded the world underground as a very special place (Crothers 2012). Those who undertook to enter did not do so lightly. Perhaps at least some of the Archaic and Early Woodland people who ventured underground individually or in small groups were seeking power obtainable only there (manifest in, for example, mirabilite, epsomite, or gypsum powder and gypsum crystals [especially satin spar and selenite]). Some caves (and sinkholes), however, were also mortuary locales. By Mississippian times (as early as Emergent Mississippian, according to the Picture Cave radiocarbon dates and those from 12th Unnamed Cave in Tennessee), twilight zone and dark zone cave art was well developed and was clearly within the corpus of formalized, aboveground Mississippian artistic and religious symbolic imagery. As suggested by several contributors to this book, late-prehistoric cave art may have been created by single individuals (or small groups) seeking warrior or other powers, or petitioning for help with sickness, natural disasters, warfare, and other problems within the community. In any case, such petitions would have been addressed to one or more of the formidable supernatural beings believed to dwell in these subterranean realms.

Hearty congratulations to the editors and authors for creating this wonderful volume, which substantively advances our knowledge about ancient cognitive worlds. I am especially appreciative of the data syntheses and interpretations provided here because I am not at all expert in rock art, or any other kind of ancient art, aboveground or below. But I *do* know something about interdisciplinary archaeology. The contents of this book—ranging from AMS dating, geochemical analyses, geo-mapping, and geological/ecological contextualization to color symbolism, stylistic considerations, interpretation of individual images and iconographic themes, to ancient cognitive constructions of The World Below—exemplify a robustly successful example within an extremely challenging locale. I eagerly anticipate subsequent studies in and about Picture Cave.

PREFACE

Carol Diaz-Granados

OVER 1,000 YEARS AGO, ancient inhabitants of the region traveled to Picture Cave to carry out rituals and paint the walls with a myriad of images that astonish the mind and excite the intellect of today's scholars. Only time will tell from what great distances these early people traveled to reach the cave we call Picture Cave.

Our purpose in putting together this volume is to bring to the attention of the world a unique prehistoric site—not only for the Eastern Woodlands but for all of North America. It is a cave whose walls display hundreds of images with an attention to detail not seen in any other recorded or known pictograph site in the eastern United States.

There are images of every imaginable creature—serpents, birds, human and animal figures; many appear to be beings not of this world. The anthropomorphic figures are portrayed in an array of clothing with various accouterments, in different poses, many brandishing weapons. There is an equal number of totally enigmatic motifs—ones that may never be understood. But after almost two decades of work and research, there is much we *can* say about Picture Cave.

Here is a cave in a remote area (by today's standards, let alone 1,000 years ago) that obviously held a great deal of importance for both local and distant populations. It drew people from at least a 100-mile radius. And judging from reported finds of Cahokia points, it was known to the Cahokia populations. It may well have drawn visitors from the far South, Southeast, and North, too. Faint images, barely visible under the later, darker ones, attest to an extremely long period of activity. A selection of the darker images painted over the fainter ones date to approximately AD 1025 (see chapter 5).

We believe this cave was a hallowed locale that served not only as a place to practice sacred rituals, but also for rites of passage, for explaining the multilayered cosmos, for vision quests, to commune with spirits in the "other world," and to bury the dead. This sacred place is located in the "womb of mother earth," which is below this, the Middle World. That alone deems it sacred, not to mention the expansive story-laden imagery that consecrates its walls.

This volume describes and discusses Picture Cave and its pictographs and, to a preliminary degree, analyzes the imagery on several levels. Each author has particular ideas and manner of writing, and all have been allowed to share, in their own style, their ideas and response to what they saw and experienced in Picture Cave between 2005 and 2007 as part of the Picture Cave Interdisciplinary Project. Some authors refer to the same image with different descriptives, but in each case, the image is depicted, so this should not be a problem for the reader.

The first part offers introductory material. Chapter 1 gives a brief overview, including a timeline of research and activities at the cave, and the Picture Cave Interdisciplinary Project, which led to this volume. In chapter 2, Simek and Cressler take an in-depth look at Picture Cave from a regional vantage point, comparing it to the many "unnamed caves" that Simek and his team have researched in Tennessee and the greater Cumberland region. To close the introductory section, Newell provides a description of the physical and biological features of Picture Cave.

The second part addresses technical research at Picture Cave. Blankenship's chapter 4 provides an exciting analysis and great insight into a selection of the pigments on the cave walls. Blankenship's findings allow us a fascinating window into the paint recipes of the ancient artists and back the antiquity of the AMS dates discussed in chapter 5 (Diaz-Granados et al.). In chapter 6, Simek et al. examine the cave's spatial attributes following a project in which he and

his research team mapped the entire expanse of cave walls. With his team he produced color panoramas of the major wall sections of Picture Cave. The second section closes with Duncan's chapter 7, in which he analyzes the meager archaeological remnants found on the cave floor by a few individuals. He extracts information from these cultural materials that points to the possible artists.

The third part, the volume's largest, is organized to include the majority of chapters on interpretation of the iconography in Picture Cave. Interpretation of ancient iconography is no longer the slippery slope it once was, given all the work and research in the ethnographic literature that has been taking place. This coupled with Reilly's yearly Iconography Workshop and his reinterpretation of the Southeastern Ceremonial Complex into the Mississippian Ideology and Interaction Sphere are advancing greater understanding in the field of iconography and cognitive archaeology.

Brown and Muller's chapter 8 offers a review of Picture Cave's place in the current redefinition of Mississippian art. This chapter anchors Picture Cave as a paramount source of early Mississippian imagery.

In chapter 9, Duncan et al. take an in-depth look at one of the most impressive figures in Picture Cave—the Black Warrior, which image was AMS dated a few years after the first three images (see chapter 5). This is followed by Reilly's essay (chapter 10) on the Underwater, or Beneath World, Spirit so prominent on the walls of Picture Cave, making an argument for the cave's Lower World importance.

Townsend's chapter 11 considers Picture Cave from a contextual perspective—its place in the landscape—and then delves into a wide selection of the pictographs and their iconography, focusing on a particular image for interpretation. Townsend uses the Omaha to shed light on this image.

Many of the anthropomorphs depicted on the walls are in battle gear with weapons. Dye addresses four major examples of combat figures and weaponry in chapter 12. Chapter 13 was composed by Osage Kathryn Red Corn after two trips to Picture Cave. She interprets a singular image that recalls a spider, first telling a personal story and then explaining the meaning of the spider symbol to the Osage tribe. In chapter 14, Diaz-Granados and Duncan interpret the possible meaning in two pairs of images that beg to be understood. Both themes can be interpreted as a form of transmogrification—a healing ritual, a burial rite, or a resurrection. Next, Diaz-Granados looks at the use of colors in Picture Cave and then offers a preliminary assessment of the styles inherent in the most typical sets of images (chapter 15). In chapter 16, Lankford ponders the question of what set of societal behaviors may have been responsible for the imagery in Picture Cave. He uses Central Algonkian and Plains ethnographic data and suggests that the images may be the result of visionary experiences. In chapter 17, Duncan identifies the characters in the complex imagery of Picture Cave, revealing details from the ethnographic literature as well as from his work with the Osage.

The fourth part is unique in that it embodies two very special chapters from an artistic perspective. First, Pala Townsend, an artist and art professor at the School of the Art Institute of Chicago, approaches her essay (chapter 18) by reviewing a selection of artists from the 1950s who were seriously influenced by American Indian art. She reflects on both their art and the art in Picture Cave and its influence in today's world. Anita Fields, an Osage artist, provides an essay from a very personal perspective in chapter 19 and includes contemporary American Indian art as well as archival photos.

Part 5, the final section of this volume, is primarily derived from interviews that took place in the cave during the Picture Cave Interdisciplinary Project and is followed by a commentary (chapter 21). Included are short interviews with William Samuel Fletcher, a full-blood Osage, and Alma Jean Maker, a full-blood Osage elder who made the trip to the cave at age 70+. Mrs. Maker, sadly, passed away in the winter of the same year (2005). A third Osage elder and author, Charles Red Corn, offers commentary on the significance and importance of Picture Cave to the Osage

tribe. Commentary from the volume editors and key cave researcher, Jan Simek, closes the volume.

Picture Cave contains such a complex array of pictographs that even after two decades, we continue to identify images that previously eluded us. We attribute this to the palimpsest nature of the images—that many of the drawings are faint and/or layered on top of still fainter images. Along with the problem of layered images, there are also very small images dotted throughout the panels. Some images, while beautifully portrayed, are not currently addressed or discussed in depth. In addition, it is important to note that most of the early work was done with only headlamps and flashlights in this dark zone cave. Anyone who enters this dark zone cave and sees the expanse of ancient imagery totally lighted with halogen lamps is taken aback. There is no known cave in the eastern United States with this copious amount of imagery and detail.

We are well aware that much more work can be done at the cave, including salvaging fragmentary remnants from the seriously disturbed cave floor. Much more analysis can and no doubt will take place in years and decades to come; however, the early work of recording and analyzing the iconography, the Picture Cave Interdisciplinary Project, and this volume with its image glossary are a more than respectable beginning. The reader should consider this volume a major first step delving into the art, iconography, and spirituality of this sacred and memorable portal to the other world.

ACKNOWLEDGMENTS

I WOULD LIKE to begin by thanking four very important people in this grand scenario: Kent Reilly, Jan Simek, and the landowners (who wish to remain anonymous). First of all, Dr. F. Kent Reilly III has been a most incredible colleague. Kent convinced the Lannan Foundation of the great importance of Picture Cave and our Picture Cave Interdisciplinary Project. He helped obtain the funding to bring four Osage (more were invited but could not attend) and fourteen scholars to Picture Cave. He also approached the University of Texas Press and convinced them of the importance of this ritual cave and the proposed volume. Kent has been a staunch supporter of our research associated with Picture Cave and through his annual Iconography Conference, held at Texas State University in San Marcos. Both Jim Duncan and I are honored to be a part of this yearly conference. Special gratitude goes to William Johnston, the Lannan family, and the Lannan Foundation for funding our Picture Cave Interdisciplinary Project in 2005 and beyond. Without their generous support, the project would not have taken place.

The other person who deserves a tremendous amount of credit is Dr. Jan Simek of the University of Tennessee, Knoxville. Jan approached me years ago and asked if he and his research team, in particular, cave photographer Alan Cressler, could photograph and map the cave for us. This was certainly an answer to my prayers. Picture Cave is not only a rare example of early Mississippian ritual cave activity and iconography, it is also a *fragile* example. Recognizing this, Jan offered to have Nicolas Herrmann, Sarah Blankenship, Alan Cressler, and himself both map and photograph all of the discernible images in Picture Cave. They also mapped the walls and landscape of the cave and stitched panoramas of the major walls. In so doing, they have preserved the imagery, walls, and layout of the cave. Furthermore, we can now work with the iconography without entering the cave and disturbing the bats. Special thanks to the Monsanto Company for the grant that enabled the initial pigment dating and to the Cave Research Foundation for additional funding.

The patience of the contributing authors is to be commended as they waited through an inordinate number of delays and legal transactions. We are grateful to the landowners for both allowing us to work in Picture Cave for almost twenty years and eventually working out with us the legal permissions for using the photographs of Picture Cave and publishing this much anticipated book. We were finally able to proceed with the creation of this edited volume in the late fall and early winter of 2010–2011.

Alan Cressler, renowned professional cave photographer, worked his magic to record the Picture Cave pictographs in color and black and white. The pictures in this book reflect his excellent workmanship. We are most appreciative of all the time Alan took to do this and to work with Jan Simek to assemble a complete glossary of images for this volume (as requested by one of the reviewers).

Another major contributor to the Picture Cave Interdisciplinary Project, as well as to the general well-being of the cave itself, is the Stygian Grotto, my local caving group. Many of the cavers from this and other local grottoes contributed their time, equipment, supplies, and expertise to both construct a gate at the cave and assist with the Project: Sally Kula, J. J. Huelsing, Herb Samples, Kevin Berdack, Rich Orr, and the late Don Rimbach. A special thanks to Philip W. Newell for all of his assistance in organizing the three gating projects and for giving the cave its name—Picture Cave.

Over the past twenty years, Jim and I have become friends with many on the Osage Reservation and from the general Osage community. Much of our

insight, including into oral traditions and the "old ways," is the result of conversations with the Osage. We sincerely thank the following: Mary Carter, Andrew Gray, William S. Fletcher, John Maker, Ardina Moore, Charles Pratt, Eddie Red Eagle, Kathryn Red Corn, Charles Red Corn, C. R. Redcorn, Frank Red Corn, the Rennick and Jech families (Jodell Heath, Alma Hager, Mary Big Elk, Delmer Rennick, Henry Rennick, Glenn Jech, John Jech), Carter Revard, Niki Revard, George Tinker Sr., Jake Waller, Everett Waller, Dudley Whitehorn, Rosemary Wood, Louis and Ruth Burns, Cora Jean (Big Elk) Jech, Frances Holding, Janice Kekabah, Alma Jean Maker, Harry Maker, Leonard Maker, Andrew "Buddy" Red Corn, Raymond Red Corn Sr., Ed Red Eagle Sr., Robert "Bob" Smith, and Ron N. Gordon.

I would also like to thank the following people who contributed in one way or another to this project: Robert Sharp, retired executive director of publications, the Art Institute of Chicago, for his assistance; Lauren Makholm of the Art Institute of Chicago for her assistance in obtaining permissions for two chapters; and William Iseminger of the Cahokia Mounds State Historic Site. A special thanks to Dr. Julie Holt for her concern and professionalism.

Last, but certainly not least, I would like to thank Theresa May, former editor-in-chief of the University of Texas Press; manuscript editor Lynne Chapman, also of the Press, for her incredible patience and assistance through the complex and lengthy process; and designer Lindsay Starr, sponsoring editor Casey Kittrell, assistant marketing manager Nancy Bryan, proofreader Regina Fuentes, and freelance editor Kathy Bork, for working with us on a book with an inordinate number of details and seeing it to completion. It has been a genuine pleasure.

LANDOWNERS' INTRODUCTORY MESSAGE

Only be careful, and watch yourselves closely so that you do not forget the things your eyes have seen or let them slip from your heart as long as you live. Teach them to your children and to their children after them.

DEUT. 4:9

THIS INTRODUCTION is probably the most difficult thing I have written. As landowners, we have an obligation to allow others the opportunity to appreciate those things which were entrusted to us and to leave them better than when we received them. We have discovered, over time, that curiosity seekers, intruders, and trespassers have vandalized the cave and taken things from inside and off the walls. It was a surprise when the editors contacted us regarding the cave, expressing a desire to meet with us and visit the site, which they had heard about from others. Jim Duncan and I have experienced close to twenty years of friendship with the common interest of exploring, and Jim's attempting to decipher, the mysteries behind the rock art pictographs on the walls of Picture Cave.

As a responsible landowner, because of my experience, it is my personal need to make others with similar possessions aware of important precautions to take when discussing possible research involving cultural and historical sites. Before beginning any negotiations, seek legal advice regarding any obligations or liabilities you may encounter. The old manner of making an agreement with a friendly handshake, a "gentleman's agreement," is no longer acceptable in today's world. The small investment of time, effort, and money you spend for legal fees at the beginning will be well compensated when working out any problem you may encounter should you engage in such an undertaking. Arrange for an Indemnity and Confidentiality Agreement prior to initiating a project, to protect you from any liability or lawsuits. It is unfortunate that what should be simple, in these times, may be complex and expensive.

We wish to give special thanks to the cave grotto members, who volunteered their time, money, and labor to tirelessly work to secure the cave by gating it to protect it from further vandalism and then, after having discovered some vandalism, again to provide volunteers to repair and strengthen the gates, making the cave entrances still more secure. Thanks also to all participants in the Picture Cave Project, including, first, the editors; then all the professionals who did chemical analysis and carbon dating; the team undertaking mapping, recording, and photographing the cave walls; and the contributing scholarly authors, who agreed to pen their thoughts on the cave art by writing a chapter for this book on Picture Cave. We had the opportunity to accompany these participants to the cave site and appreciated meeting them and observing their interest and work. A special thanks to Jim Duncan, without whose help, enthusiasm, and perseverance this project could never have been accomplished.

When friends with common exploratory desires are called upon to come together in the interest of advancing research by delving into the mysteries behind the images left on the walls of the cave and attempting to decipher the meanings of said images, it can be difficult for them. Cultural and historical understanding of the ancient livelihood is important for the understanding of future generations. Rock art pictographs need to be preserved and protected from future vandalism.

Through publication of this book, we hope we are helping provide an avenue for future generations to better understand ancient symbols, cultural beliefs, images representing supernatural beings or heroes, weapons, community hunting tactics, cosmic systems, and depictions of life after death.

After much thought and soul searching, the landowners have decided that, at this point, it is time to consider having others be responsible for the preservation and protection of Picture Cave.

Any and all future research projects at the Picture Cave site and surrounding landowners' property may be undertaken only with written permission by the landowners.

Upon publication of the manuscript, titled *Picture Cave: Unraveling the Mysteries of the Mississippian Cosmos*, the landowners' commitment to "The Picture Cave Interdisciplinary Project" is complete.

The Landowners of Picture Cave

Overview

CHAPTER 1

Introduction to Picture Cave and the Picture Cave Interdisciplinary Project

Carol Diaz-Granados

PICTURE CAVE was brought to the attention of professional archaeologists in the early 1990s by avocational archaeologists. It was totally by chance that we learned of the cave. We were shown drawings of some of the images—drawings so detailed that it was hard to believe they were genuine. Although we did not move immediately to check it out, we were soon contacted by Professor Patty Jo Watson of Washington University (where I teach), who informed us that she had recently visited the cave with George Crothers, her graduate student at the time, and asked us to take a look at the images on the walls of the cave. We contacted the legal landowner, and that began what has turned into a two-decades-long project of ongoing research, recording, and analysis: the 2005–2007 Picture Cave Interdisciplinary Project; the 2006 SEAC Symposium on Picture Cave held in Little Rock, Arkansas; and this edited volume.

When we first visited this dark zone cave with the landowner, we found a small fragment of the wall on the cave floor. It was a pictograph of a bird. It had been pried off the wall with a wooden wedge. The wooden wedge had been placed back on the wall ready to pry off another image! The floor of the cave was practically devoid of any cultural materials. It was obvious that the cave had been visited and potted for over 150 years—with historical names, dates, and graffiti going back to the 1840s. A copious amount of vandalism had damaged the cave floor, which was seriously disturbed from all the looting. This made it very difficult to move around in the total darkness. Despite the lack of cultural materials and a dearth of stratigraphy, we believed the cave to be a valuable resource for information and iconography and decided to record and study the myriad images on the walls.

Early American Indians came to this cave to create the hundreds of drawings on the walls, drawings that appear to be tied to rituals, magic, the Siouan cosmos and oral traditions. The accelerator mass spectrometry (AMS) dates and the exemplary Mississippian graphics have generated a great deal of interest and discussion among archaeologists and other researchers concerned with the origins of the Southeastern

Ceremonial Complex (SECC)—more recently, Mississippian Ideological Interaction Sphere, MIIS (Reilly 2007:3). The realistic, detailed portrayals of several important characters, no doubt supernaturals and subjects of Siouan oral traditions, contribute much to our understanding of the Mississippian cosmology in the greater Cahokia area. Many scholars consider Picture Cave the most important site of its type (dark zone cave) in eastern North America. It has contributed substantial new data to the prehistoric record, and the AMS dates obtained from the pigments have revised a portion of the chronology for early Mississippian iconography.

Another factor contributing to the interest in and importance of Picture Cave is its correlations to a pictograph site in southwestern Wisconsin—the Gottschall Site. The Gottschall Site is roughly 300 miles from Picture Cave. In spite of the distance, a number of style attributes connect the two sites: (1) thin arms; (2) legs that taper and sometimes fade; (3) wide, oval eyes; (4) concentric circles on the shoulder; (5) patterned loincloths; (6) the long-nosed maskette (on a figure's ear in Picture Cave, on a figure's chest at Gottschall);[1] and (7) vertical facial and body stripes. In 1966, Salzer obtained a date for the Gottschall Shelter's "E zone" level, from which a sandstone head was excavated (Salzer 1987, 1999). The sandstone head, excavated by Grace Rajnovich, has oval eyes and vertical stripes on the face, which likens it to the Morning Star figures at Picture Cave. The date Salzer obtained of AD 1060 corresponds quite closely to the weighted average of dates (AD 1025) obtained from pigment samples in Picture Cave (see chapter 6).

However, there is another unique motif the two sites have in common: the head association of a "swirling sun" headdress or aura (figure 1.1a). At Picture Cave, it is seen in the small depiction of a victorious birdman standing over a fallen warrior (figure 1.1b), and at Gottschall it is seen on the main anthropomorphic figure (figure 1.1c). I believe that this association offers the most important and affirming connection between these two sites if only for the unique comparative iconography—which in turn connects to the comparative oral traditions most likely in place at the time. Some of these oral traditions not only have an indisputable depth in time, but they also have broad coverage throughout this region of known early American Indian occupation.

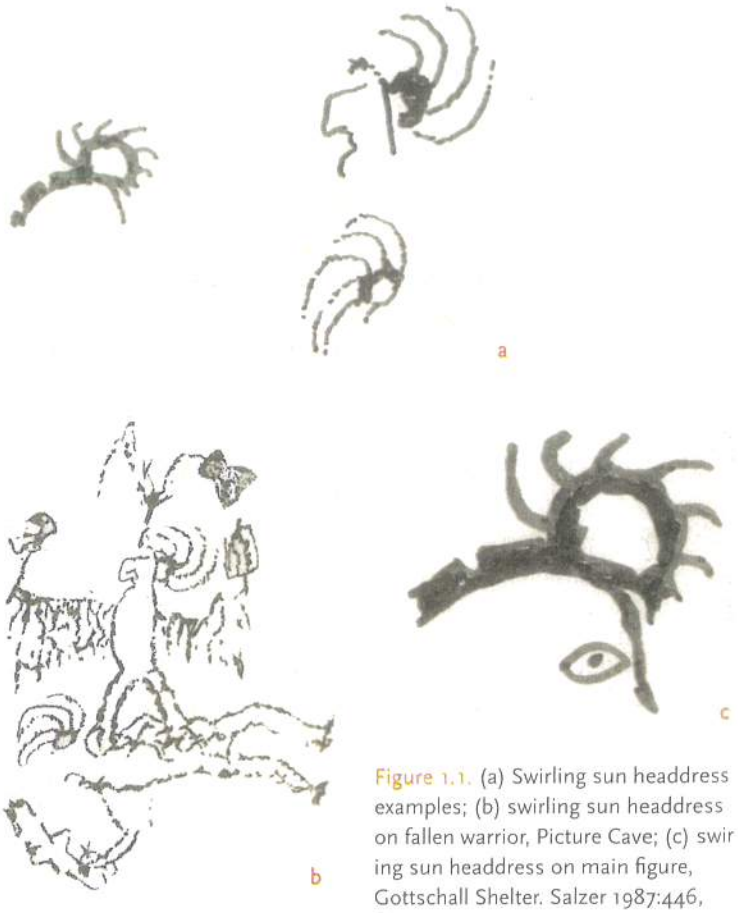

Figure 1.1. (a) Swirling sun headdress examples; (b) swirling sun headdress on fallen warrior, Picture Cave; (c) swirling sun headdress on main figure, Gottschall Shelter. Salzer 1987:446, figure 15.

1. "At this time, Red Horn's first wife was pregnant and, finally, the old woman's granddaughter gave birth to a male child who was the very likeness of his father, Red Horn, having long red hair and having human heads hanging from his ears. Not long after this, the giantess also gave birth to a male child whose hair was likewise just like his father's. Instead of having human heads hanging from his ears, he had them attached to his nipples" (Radin 1948:129).

The Dhegihan Connection

Despite the growing consensus that prior to the influx of Europeans, the large (20,000 +/-) population of Cahokia split up into smaller groups, moved west and south, and became the historically powerful Dhegihan Sioux factions (and possibly the Chiwere Sioux), there are those who continue to question this theory. With a limited amount of space (and at the request of one of the reviewers), I take this slight jog to review just some of the reasons and references that led us to this theory.

Since long before the completion of my doctoral dissertation (1993), Jim Duncan and I had been talking about a probable Dhegihan Sioux connection to both Missouri rock art and Cahokia Mounds. We often brought up this conjecture in papers presented at conferences, and the subject was cautiously approached in my doctoral dissertation (1993:334-342, 337, passim).

In 1993, I discussed the unique subject matter of several rock art sites as probably being of Siouan origin. In addition, at a minimum of two sites, there was distinct subject matter that related to the iconography in parts of Radin's Winnebago (Chiwere) collections (1948) (Diaz-Granados 1993:337–339). At least three sites had beautifully proportioned and executed figures that not only set them apart but that also linked them to the Braden art style. I linked one of these sites stylistically to the Gottshall Shelter Site in southwestern Wisconsin (Diaz-Granados 1993:171, 187–188).

We picked up on this likely connection largely because of our readings in Eggan and Griffin (1952:40–42), Fletcher and La Flesche (1911), Fowke (1910:5–6), Radin (1948), and possibly even Williams (1980:108), among others. There were bits and pieces of supportive, scholarly commentary that encouraged our suspicions that the great Cahokia population did not "disappear," as is often claimed, but, rather, split up into what became recognized in historic times as the five cognate tribes of the Omaha, Osage, Ponca, Kansa, and Quapaw. Again and again we were met with great skepticism—and even criticism.

Then, beginning in the late 1980s and continuing with increasing emphasis, publications began to appear basically supporting this theory. It is interesting to observe how a consensus slowly developed. In 1989, J. A. Brown attributed the Braden style as originating at Cahokia (1989a:188–196). By 2004, Brown had gone even further, saying that "available information points to people who spoke Dhegiha and Chiwere-Winnebago Siouan languages as having the clearest claim to pre-Columbian occupation of this area" (2007b:58). It is not until almost two decades later that he completes the equation and concedes an association between Cahokia, Braden, and the Dhegihan Sioux (2011:41).

The Cahokia-Dhegihan connection was further advanced with the publication of *Hero, Hawk, and Open Hand: American Indian Art of the Ancient Midwest and South* (Townsend et al. 2004). In that volume, Hall refers to the actual participants of Cahokia as the Dhegihans (102) while cautiously mentioning several other groups peripherally. Hall concedes the existence of "a division of the Siouan family that is more likely to have included actual participants is the Dhegiha or Dhegiha Sioux." He goes on to say that "there is much to be said for seeking the inheritors of Cahokia's cultural legacy west of the Mississippi among Dhegihan speakers, specifically among the Omaha, Ponca, Osage and Kansa," adding, "with more to be learned from studying the beliefs and cultural backgrounds of the Chiwere-Winnebago" (Hall 2004:102). That same year, *Art of the Osage* was published with a suggestion by Bailey, in discussing the Osage, that "others have noted cultural similarities with Cahokia" (2004:3). Kehoe joins in and links the Dhegiha to Cahokia (2007:247).

By 2011, Brown is connecting the Braden art style not only to Cahokia but also to the Dhegiha Sioux. He is also recognizing the importance of the iconography in the rock art record, specifically, the classic Braden stance of the Black Warrior at Picture Cave

and the Dancing Warrior at Rattlesnake Bluff (personal communication, 2009). Brown states, "It is not difficult to connect the Dhegiha Sioux to the archaeology of the Prairie Peninsula and to the great townsite of Cahokia" (2011:41). At this point, we feel that our presumption, which began in the early 1980s, has come to be largely the accepted theory.

The Antiquity of the Pictographs

Because of the great detail and clarity in many of the pictographs, there was some question regarding their antiquity. In 1996, I obtained a grant from the Monsanto Chemical Company to date the pigments in a selection of the drawings. If the drawings were indeed ancient, as we suspected, it was decided that we would pursue long-term research at the cave with the landowners' permission. I contacted Marvin W. Rowe of Texas A&M University, one of only two researchers doing pigment dating at the time, and asked if he would come to Picture Cave in Missouri to take and date pigment samples. He kindly agreed.

Until 1987 (Van der Merwe et al.), there was no method for the direct dating of pigments in pictographs. The Missouri cave site was the first, to our knowledge, in the Central Mississippi River Valley region, to have pigment samples dated from parietal art (see Chapter 5). Drs. Marvin W. Rowe and Marian Hyman of Texas A&M's Analytical Chemistry Department processed four samples using a method they developed. Their plasma-chemical technique extracts carbon from the pigment and converts it to carbon dioxide. The carbon dioxide is then sent to an AMS laboratory, where the amount of carbon-14 is counted and the age of the sample determined. Four of the carbon samples Drs. Rowe and Hyman extracted at Picture Cave contained sufficient quantities of carbon for AMS dating. As previously mentioned, the weighted average of the four dates is AD 1025 (Diaz-Granados et al. 2001). The four black pigment samples yielded dates that place their affiliated motifs into a developing prehistoric time frame for Midwest rock art.

With the knowledge that Picture Cave was indeed an important American Indian ritual cave site, we proceeded to install gates at the entrances with the landowners' permission. Also with the permission of the landowners, the Picture Cave Interdisciplinary Project was organized in 2005 to bring in five scholars/professors (from the University of Illinois, Southern Illinois University, Northwestern University, Texas State University, and the University of Alabama); specialists in American Indian art and iconography; two artists (one Osage); four Osage Indian elders, an artist and sculptor from Tulsa, Oklahoma; the executive director of the Osage Tribal Museum; an Osage elder from Pawhuska, Oklahoma; and an Osage elder from Hominy, Oklahoma (two other Osage were invited but could not make it); a museum curator from the Art Institute of Chicago; a folklorist from Lyon College in Arkansas; an internationally renowned cave archaeologist; a number of expert cavers; an artist and painting professor from the School of the Art Institute of Chicago; a videographer; cavers, students, and the landowners to view and study the pictographs on the cave walls and to share their thoughts about the imagery. With the assistance of Dr. F. Kent Reilly III, a Lannan Foundation grant was obtained that would cover the expenses (transportation and hotel) of the visiting scholars, artists, and Osage. The grant also covered a minimum of equipment, including caving gear, halogen lighting, and hundreds of feet of electrical cord, a twenty-four-passenger transport van for the weekend, and a professional videographer to record the project. Osage elder and full blood William S. Fletcher recited an Osage prayer at the cave entrance before we entered. As always, tobacco offerings were left in the cave before any work was begun.

The Picture Cave Interdisciplinary Project participants spent two days at the cave and agreed to pen their thoughts on the cave art and present a paper at the 2006 Southeastern Archaeological Conference in Little Rock, Arkansas. Each author agreed to turn his or her paper into a chapter for this edited volume on Picture Cave.

In August 2005, Dr. Jan Simek, Dr. Sarah Sherwood, and Sarah (Annie) Blankenship came to the cave to check for any stratigraphy. They dug test pits and checked for intact stratigraphy. The testing was promising but inconclusive. Dr. Simek returned in September and brought the Cave Archaeology Research Team (CART)—Simek, Nicholas Herrmann, Sarah Blankenship, and Alan Cressler)—and all necessary equipment to completely map the walls of the cave and methodically photograph each individual image (see the appendix). The crew worked from 8:00 AM until 6:00 PM or later—nonstop—mapping, recording, and photographing for five days straight. About 300 images were photographed by eminent cave photographer Alan Cressler and recorded by Dr. Simek and Ms. Blankenship, while Dr. Herrmann did the landscape mapping. As a result of their work, Dr. Simek and crew were able to produce detailed panoramas of the three major walls.

Brief Chronology of Picture Cave Research

1990

The cave is brought to our attention by avocational archaeologists.

1991

I contact the landowner to get permission to visit the cave. When we come to visit the cave, with the express permission of the landowners, and the landowner with us, there is evidence of serious potting on the floor of the cave and a wooden wedge stuck behind a section of the paintings on the wall. It is obvious that someone was trying to pry the pictographs off the wall. One small section of the wall is discovered lying on the ground, having been already pried off by vandals. We encourage the landowner to take it home, expecting that the perpetrator will be coming back to get it. There is also evidence of frequent and ongoing visitation and looting by trespassers. Initials on the cave walls date back to 1848. We ask for and are granted permission by the landowners to do research at the cave. Because it is a dark zone cave, all work is done with helmet lights and lanterns. All visits to the cave are made with the landowner present because we want to be sure the landowner knows we are doing scholarly research and recording the pictographs.

EARLY 1996

With the landowners' permission, we organize members from my cave grotto to install a gate at the cave's main entrance. The supplies are donated by the caving grotto members and supplemented by a small grant from the Cave Research Foundation. Don Rimbach donates the 100-pound solid steel gate.

LATER IN 1996

I receive a grant from the Monsanto Chemical Company that enables us to secure the services of Drs. Marvin Rowe and Marian Hyman, analytical chemists from Texas A&M University. Dr. Rowe is the leading specialist in dating pigments from pictographs and has done this type of work in many parts of the world. Drs. Rowe and Hyman come in October and take five small samples from four panels.

1997

After some problems and delays with the analytical equipment, dates are finally processed and delivered by Dr. Rowe. They range from AD 985 to 1165 with a weighted average of AD 1025 (see chapter 5). This means that the cave paintings, at least the ones tested, are approximately 1,000 years old. A report on the dates and research is submitted to *American Antiquity*.

1998

The caving grotto members seal the small side entrance to the cave. Research and recording continue.

1999

The landowner finds the major cave gate partially vandalized; Jim Duncan, Philip Newell, and others repair it.

2000

One of the caving grotto members designs and builds a gate to secure the third and last small entrance to the cave. The caver pays for all the rebar and supplies and donates the use of his personal power equipment and generator for the cause.

An article, "Of Masks and Myths," is published in the *Midcontinental Journal of Archaeology* on the long-nosed maskette image at Picture Cave (Duncan and Diaz-Granados 2000).

2001

A second article is published (in *American Antiquity*): "AMS Radiocarbon Dates for Charcoal from Three Missouri Pictographs and Their Associated Iconography: A Report" (Diaz-Granados et al. 2001).

On a research trip to the cave, our work group encounters evidence of recent looting around the entrance. The perpetrators are tracked by Jim Duncan and the landowner, and the family that is responsible is confronted and cautioned.

2002

We bring the director of the Osage Tribal Museum in Oklahoma, Kathryn Red Corn, to visit the cave and view the pictographs, believing that they were done by her ancient ancestors. Research, recording, and writing continue.

2003

Carol begins organizing the Picture Cave Interdisciplinary Project and invites several scholars—specialists in American Indian art and iconography, Osage, archaeologists, a folklorist, two artists, and cave specialists—to participate.

EARLY 2005

With the help of Professor F. Kent Reilly III, funding is obtained from the Lannan Foundation to bring in scholars and Osage for the Picture Cave Interdisciplinary Project. Caving gear and other supplies are rented or purchased for the project.

JULY 2005

The initial cave trips for the Picture Cave Interdisciplinary Project take place, with an average of twenty-five in attendance. A videographer records the project.

AUGUST 2005

Dr. Jan Simek comes to the cave to check for any stratigraphy. He brings Dr. Sarah Sherwood and Sarah Blankenship to dig test pits and check for intact stratigraphy.

SEPTEMBER 2005

Dr. Simek returns with the Cave Archaeology Research Team and all necessary equipment to completely map the walls of the cave. Alan Cressler methodically photographs each individual image in both color and black and white. The crew works for five days straight. Cressler discovers a small piece of burnt cane on one of the lower levels.

OCTOBER 2006

The Picture Cave Symposium is presented at the annual Southeastern Archaeological Conference (November 8–11, 2006) with twelve speakers (participants in the Picture Cave Interdisciplinary Project). Professor Patty Jo Watson serves as discussant; Carol Diaz-Granados and Kent Reilly, organizers; and Carol Diaz-Granados as chair. A standing-room-only crowd is on hand to hear the papers. Presenters include Sarah Blankenship, Jim Brown, Jim Duncan, David Dye, Anita Fields, George Lankford, Jon Muller, F. Kent Reilly III, Jan Simek, Pala Townsend, Richard Townsend, and Patty Jo Watson.

MAY 2007

The first deadline is given to participants for submission of first drafts for the Picture Cave volume. Five chapters come in on deadline. Reminders continue to go out to authors to get their drafts to the editors.

MAY 2008

Twelve chapters are in. From 2008 through 2009, authors continue to submit chapters. Over the next two years, the remainder of the first drafts slowly arrive.

2009–2010

Delays resulting from restricted photo permissions by landowners slow the book's progress.

2011

Permission details are worked out with landowners. A publisher is approached. The three coeditors meet with Theresa May, then editor-in-chief at the University of Texas Press, and give her a manuscript, color photos of the cave art, and one of the large wall panoramas. Shortly thereafter, a contract from the press is sent, signed, and returned.

FALL OF 2012

With all chapter drafts in, formatting begins.

APRIL 2013

All chapters, photos, and illustrations are sent to Theresa May at the University of Texas Press.

JANUARY 30, 2014

Copyedited manuscript is returned to editors for final check by all contributing authors.

MARCH 17, 2014

Manuscript is returned to the University of Texas Press for final cleanup.

AUGUST 2014

Final prooging of pages takes place, and indexing begins.

SPRING 2015

Picture Cave book is published.

CHAPTER 2

"Tracings in the Idleness of Art"

Picture Cave in the Context of Southeast Prehistoric Cave Art

Jan F. Simek amd Alan Cressler

Inside a cave in a narrow canyon near Tassajara
The vault of rock is painted with hands,
A multitude of hands in the twilight,
    a cloud of men's palms,
no more,
No other picture. There's no one to say
Whether the brown shy quiet people who are
    dead intended
Religion or magic, or made their tracings
In the idleness of art; but over the division
    of years these careful
Signs-manual are now like a sealed message
Saying: "Look: we also were human; we had hands,
    not paws. All hail
You people with cleverer hands, our supplanters
In the beautiful country; enjoy her a season, her beauty,
    and come down
And be supplanted; for you also are human."

ROBINSON JEFFERS, *Hands* (1928)

IT WAS A GREAT PRIVILEGE for the Cave Archaeology Research Team (CART) from the University of Tennessee to be asked to work on the archaeology of Picture Cave in Missouri. This remarkable site is truly an American masterpiece, ranking with some of the great prehistoric art sites in the world: the Maack Shelter of the Brandberg in Namibia; Kakadu in Australia's Northern Territory; Naj Tunich in Guatemala; Painted Cave in California. And while one must hesitate to call Picture Cave "an American Lascaux" (as there honestly is only one Lascaux), it is not far removed from that extraordinary place in Périgord (Aujoulat 2004). Maybe an "American Chauvet"?

While Picture Cave is remarkable, it is not unique in the archaeological record of the Eastern Woodlands. In fact, there are more than seventy cave art sites known in the eastern part of North America (Faulkner 1988; Simek 2008; Simek and Cressler 2005, 2009; Simek et al. 2012). Before discussing these sites further, it should be made clear what is meant by "cave art site." Cave art here is taken to be graphic images produced on the ceilings, walls, and/or floors in the dark zone reaches of caves, beyond the region where external light penetrates the absolute darkness (the area where exterior daylight can still be seen is referred to as the "twilight zone"). The art, therefore, was made in places that presented logistical and technical challenges for the ancient artists. Light sources had to be transported and kept illuminated, equipment and the human body had to be protected against the rocky and wet surfaces of karst interiors, supplies enough for the anticipated expedition had to be brought in from the outside. In short, making this art required knowledge, planning, and preparation. Each cave art site represents a complex and intensive use of a foreign and dangerous landscape (Simek and Cressler 2001).

Less than a half dozen of the known prehistoric cave art sites in the Eastern Woodlands are located west of the Mississippi River, with several at the northern end of the Mississippi Valley (Boszhardt 2003) and a few known from Arkansas and the

Missouri/Mississippi River confluence region. It is likely that there are more to find west of the Mississippi, especially in the karst-rich regions of Arkansas and Missouri. By far, the greatest number of cave art sites is in the Appalachian Plateau region east of the Mississippi River Valley, where more than sixty sites have been recorded (Simek 2008; Simek and Cressler 2005, 2009). Clearly, the production and use of cave art is an important aspect of the southeastern prehistoric record. In contrast to the case west of the Mississippi, southeastern art caves have great time depth (nearly 6,000 years) and predominantly occur in the dark zone of caves; in some cases, prehistoric artists traveled several kilometers underground to practice their craft (Simek et al. 1998).

In this chapter, the cave art record from the Southeast will be reviewed as it is presently understood and an attempt will be made to relate what has been found in the Appalachian region to Picture Cave and its remarkable corpus of prehistoric art. After a brief overview of the southeastern cave art tradition, we will concentrate on those sites and subject matters that are contemporary with and most similar to Picture Cave. Some carbon-14 age determinations made directly on several of the Picture Cave images are surprisingly early (tenth to eleventh century), given the subject matter of the paintings themselves, which appear to reflect religious iconography from the fourteenth century. As it turns out, contemporary sites in the Southeast also exhibit graphic links with later artistic traditions, indicating a relatively long developmental trajectory for some of the imagery associated with classic Mississippian iconography. The implications of this are important for understanding Eastern Woodlands prehistory.

Overview of Southeastern Prehistoric Cave Art

Prehistoric dark zone cave art was actually known among a small group of cavers in the Southeast from at least the 1950s. Middle Tennessee cavers recorded prehistoric engravings at the mouth of 12th Unnamed Cave during a regional survey in conjunction with research by biologist Tom Barr (Barr 1961). How much earlier the 12th Unnamed Cave petroglyphs had been discovered is unclear. The site was kept secret, unknown to archaeologists, until Charles Faulkner of the University of Tennessee was taken there in the 1980s. Faulkner had begun the first archaeological study of a Tennessee cave art site, Mud Glyph Cave, discovered in 1980 (Faulkner [ed.] 1986; Faulkner et al. 1984), and he had made inquiries among the caving community about the possibility of other prehistoric cave art sites in the region. Mud Glyph Cave itself was discovered when a recreational caver explored a narrow subterranean stream passage and saw images incised into the wet clay lining the stream banks. The caver alerted an archaeologist friend, who told Faulkner about these images. Faulkner quickly recognized that the art was prehistoric and initiated a documentation project.

Mud Glyph Cave art was seen as resembling that found on Mississippian ceremonial objects (Muller 1986), and Faulkner believed it was linked to the wider Mississippian iconography labeled by Waring and Holder as the "Southern Cult." Other sites quickly began to come to light (Faulkner 1988; Faulkner and Simek 1996; Simek 1996; Simek et al. 1997).

Since the discovery of Mud Glyph Cave, dark zone art has been recorded in seventy other caves in the karst regions of Tennessee, Kentucky, Virginia, West Virginia, Alabama, Florida, and Georgia. As we have noted in several publications (Simek, Frankenberg et al. 2001; Simek and Cressler 2001, 2005, 2009), southeastern cave art sites occur in a variety of environmental contexts. We still find no patterned relationship between specific or characteristic site environments and the presence or nature of cave art. Some art caves are long (i.e., more than 500 meters of passageways); some are short. Some have flowing water near the area where art assemblages are found; many do not. Most of the art caves we have documented occur in the Appalachian Plateau physiographic province (including the Cumberland Plateau uplands and the Highland Rim of the Nashville

Basin), while a significant number are in ridge and valley contexts. Nearly half of the sample is low in a major river valley, while the rest are located in higher elevation tributary stream valleys.

One geographic pattern may be emerging, although it cannot yet be quantified. In Mesoamerica (the other New World region where prehistoric cave art was commonly produced), cave shrines are often located in relation to large ceremonial centers (Stone 1995), either under the centers themselves or according to a cosmological model for locating them (Bassie-Sweet 1996). According to Bassie-Sweet, Mesoamerican cave shrines were very much a part of the landscape architecture of ceremonial centers (1996:113). This is not the case in the Southeast of North America. In only a very few cases are southeastern cave art sites found near large prehistoric settlements (Simek, Frankenberg et al. 2001). Most commonly, they are far from central habitation sites, often closer to other cave art sites (and to open-air rock art sites) than to the contemporary mound-based ceremonial centers that dot the river bottomlands of the region. In particular, prehistoric cave art sites are concentrated in the cave-rich karst lands of the Cumberland Plateau and Highland Rim physiographic provinces (Fenneman 1938), the artists perhaps drawn by the high places afforded by the plateau as natural "mounds" in some sense, but these are *not* regions where large communities were located. This suggests a different cosmological landscape from that influencing site placement in Mesoamerica, but we are convinced that it is still a cosmological landscape being expressed (Simek et al. 2013); for a similar perspective, compare this notion with work on Arkansas open-air rock art by Sabo and colleagues (Hilliard et al. 2005). We continue to examine this pattern in our ongoing work in the region.

Thus, while most sites seem to be associated with regional karst terrain, no other obvious location determinants are apparent. We are still unable to predict where cave art sites will be within the more than 20,000 known caves of southeastern North America.

Cave art in the Southeast comprises petroglyphs engraved in stone; painted pictographs of mineral pigments, charcoal, and clay; and perhaps the region's "signature" art form, mud glyphs in damp clay. There is variation in where these different art types can be found: pictographs and petroglyphs are also found on exterior rockshelter walls and bluff faces; mud glyphs are found exclusively inside caves. Most often, only one kind of art is found in a given cave (as appears to be the case for Picture Cave). There are, however, some exceptions to this. Mud glyphs and petroglyphs are occasionally found in the same cave, but one or the other form is always numerically dominant. Pictographs are often found in association with other art types, but this is because they are the rarest form anyway. Only in 11th Unnamed Cave in Tennessee are all three methods found in the same art assemblage (Simek, Faulkner et al. 2001). As has been noted, much of the subject matter of prehistoric southeastern cave art seems to reflect some of the central tenets of Mississippian period religion: death, heroes, ancestors, nature, warfare, and transformation (Simek and Cressler 2008). Art that dates before the Mississippian period is different (Crothers et al. 2002; Simek et al. 1998).

There is a great deal of variability in the archaeological contexts of southeastern cave art, and this, in part, reflects the complexity of prehistoric cave use more generally in the region. In 1986, Patty Jo Watson defined four types of prehistoric cave utilization in the Eastern Woodlands, including exploration (documented by torch remnants and footprints), mining (with evidence for industrial extraction of some raw materials), burial (the presence of human remains), and ceremonial caves (primarily exemplified by the presence of cave art) (Watson 1986). Prehistoric cave art in our sample is associated with all of these activities. Nearly every cave art site has evidence showing that prehistoric explorers examined the entire cave, often visiting many miles of passageways, not just where the art was produced (Franklin 2002). Many of the sites in our sample are (or were) burial caves

(Simek and Cressler 2005, 2010; Simek et al. 2004). None of these burial caves is very long, although lightless reaches are present in many of them. A smaller number of caves show evidence of cave art in association with clay, chert, or mineral mining (Simek et al. 2001). Watson's activities were not mutually exclusive.

The Chronology of Southeastern Cave Art

The chronology of southeastern prehistoric cave art is beginning to emerge, with more than 100 radiocarbon age determinations now available from these sites (Simek, Cressler, and Douglas 2012). There is as yet no Paleo-Indian or Early Archaic date in this series, so we have no evidence to indicate that cave art was a cultural facet of the first settlers in the region. A number of determinations show that artwork in deep caves was produced during the Archaic period (before ca. 1000 BC), although most Archaic ages fall rather late, into the Late or Terminal Archaic phase in our region. There are a few exceptions to this.

The earliest cave art age determination that we know of comes from 48th Unnamed Cave near Knoxville, Tennessee. That cave contains two black pictographs (Creswell 2007), both representational (figure 2.1), comprising an anthropomorph with a raised linear shape in one hand (perhaps a weapon) and an antlered quadruped facing away to the anthropomorph's right. Compositional analysis of the pigments used to make these images was carried out at the University of Tennessee by Sarah Blankenship (2007), using scanning electron microscopy with energy dispersive spectroscopy. X-ray diffraction was also utilized to identify oxalates that might cause sample contamination sufficient to confuse accurate radiocarbon age determination. Control samples of bare, unpainted limestone were taken adjacent to the pictographs. The major elemental composition of both black images was carbon (43.68–63.28 atomic percentage, depending on the pigment sample). No evidence for other inorganic contributions to the black coloring was identified. The control sample contained neither carbon nor calcium oxalates, but was composed of calcite and quartz with a few minor mineral impurities.

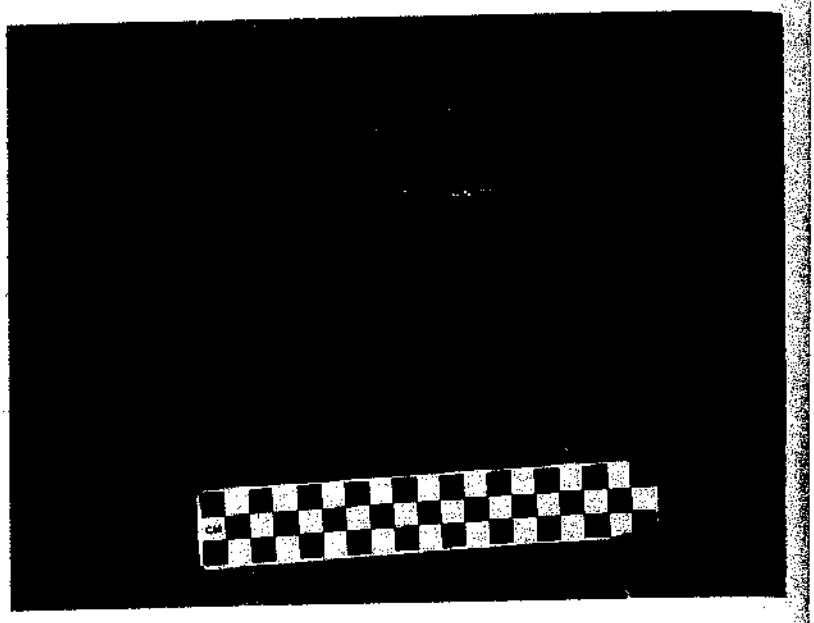

Figure 2.1.
Early representational pictographs of an anthropomorph and a quadruped, 48th Unnamed Cave, Tennessee.

Based on these results, the samples were determined to be suitable for radiocarbon age determination, and material from the quadruped pictograph was submitted to the Illinois State Geological Survey C-14 laboratory, where an accelerator mass spectrometry (AMS) target was prepared and sent to the Lawrence Livermore Laboratory for dating by AMS. An age of 4980 + 35 radiocarbon years before the present (rcybp) (ISGS-A0727, CAMS-127175) was obtained. This determination calibrates to between 3930 BC and 3650 BC at the 95 percent CI, a very ancient date compared to others we have obtained in cave art sites, but, importantly, a direct date on the pictograph itself. Thus, cave art in the Southeast may be as much as 6,000 years old.

Terminal Archaic ages have been obtained in association with parietal artwork from very deep cave contexts, including mud glyphs from Adair Glyph Cave in Kentucky, with a carbon-14 determination of 3560 + 110 bp (DiBlasi 1996). In 3rd Unnamed Cave, Tennessee, dates on hearth charcoal recovered more than a kilometer underground also indicate a Terminal Archaic occupation (Simek, Franklin et al.

1998). It is clear that Archaic hunter-gatherers were the first to produce parietal art in southeastern caves and that at least some art production accompanied other deep cave activities, including exploration and mining (Simek 2008).

The Woodland period (ca. 1000 BC–AD 900) has the greatest number of age determinations for cave visitations in the Eastern Woodlands, but cave art sites are few, given the scale of Woodland cave use. Woodland-period age determinations for cave art sites come from Mud Glyph, 2nd, 5th, 6th, and 25th Unnamed Caves in Tennessee, Crumps Cave in Kentucky, and 19th Unnamed Cave in North Alabama. Three of these are burial caves, suggesting Woodland mortuary use of cave art sites (Simek and Cressler 2010; Simek et al. 2004). The most frequent chronometric determinations for cave art are associated with the Mississippian period (AD 900–AD 1600). Within that period, a cluster of carbon-14 determinations is evident between AD 1200 and AD 1400. Thus, the Mississippian period seems to be the culmination of southeastern cave art production.

Based on our current chronological information, it is evident that cave art in the Southeast clearly has a relatively great time depth, spanning nearly 6,000 years. Over this time span, the cultural contexts of the art comprise a great deal of ecological and cultural variability, spanning as they do the last stages of hunter-gatherer economies in the region, the domestication of plants, and the adoption and elaboration of complex agricultural societies. This contextual complexity, in fact, makes interpretation of Southeast cave art rather challenging.

TABLE 2.1. Selected radiocarbon age determinations for southeastern cave art

CAVE	RADIOCARBON AGE (RCYBP)	TYPE OF ART
Picture Cave	1090 + 80	Pictographs
Picture Cave	1000 + 70	Pictographs
Picture Cave	950 + 100	Pictographs
Picture Cave	940 + 80	Pictographs
12th UC, Tenn.	1050 + 40	Petroglyphs, mud glyphs
11th UC, Tenn.	1030 + 90	Petroglyphs, pictographs, mud glyphs
30th UC, Ala.	1030 + 40	Pictographs
Little Mountain Cave, Va.	1020 + 120	Mud glyphs
2nd UC, Tenn.	970 + 60	Mud glyphs
Williams Cave, Va.	955 + 75	Mud glyphs
31st UC, Tenn.	950 + 40	Pictographs
11th UC, Tenn.	960 + 60	Petroglyphs, Pictographs, mud glyphs
12th UC, Tenn.	960 + 50	Petroglyphs, mud glyphs
12th UC, Tenn.	960 + 60	Petroglyphs, mud glyphs
7th UC, Tenn.	930 + 40	Petroglyphs
30th UC, Ala.	930 + 40	Pictograph

Notes: Date sample and laboratory references are in Díaz-Granados et al. 2001; Simek et al. 2013. UC = numbered unnamed caves.

Picture Cave in Context

Twelve carbon-14 age determinations of the more than 100 we have for southeastern cave art sites fall within the range of those from Picture Cave (i.e., 1090–940 rcybp), and these dozen come from eight separate sites (table 2.1). In the Appalachian uplands, these ages span the Late Woodland/Emergent Mississippian transition. The eight southeastern cave art sites contemporary with Picture Cave are scattered over a wide area. Two are in Virginia, and we will not discuss those here because we have not had the opportunity to study them. The six caves we will discuss include one in the Tennessee River Valley of northeastern Alabama, and five others in the Cumberland Plateau, Highland Rim, and Nashville Basin of Tennessee. All three art forms are present in these caves, with mud glyphs the most common format. These sites contain the earliest pictographs so far recorded in southeastern cave art *except* for the determination from 48th Unnamed Cave. Mud glyphs and petroglyphs both commonly occur in the more ancient

Archaic- and Woodland-period cave art sites, but pictographs (the only art form in Picture Cave) may be a characteristic element of an emerging Mississippian cave art tradition. We will examine the specific sites in chronological order from the earliest one that overlaps with the Picture Cave carbon-14 ages.

12TH UNNAMED CAVE, TENNESSEE

Perhaps the cave art site most similar to Picture Cave in the Southeast, both chronologically and in terms of content, is 12th Unnamed Cave in Tennessee. Nine AMS carbon-14 age determinations from this cave show that it was visited from AD 625 to AD 1100. It thus spans the transition from the Late Woodland to the Early Mississippian periods in Middle Tennessee; both lithics and ceramics from the site confirm this chronological placement, as do artifacts recovered from outside the cave entrance. As previously noted, 12th Unnamed Cave was the first art cave discovered in Tennessee, and it remains one of the most complex. Indeed, it is the very richness and complexity of the art assemblage in 12th Unnamed Cave that highlights its similarities to Picture Cave.

We have not yet completed our inventory of the cave art in 12th Unnamed Cave, but our catalog currently contains 264 images with at least 40 more to document. Thus, there are something around 300 individual images in the site, a number quite similar to the 294 we cataloged during our documentation of Picture Cave. These values are a bit higher than the next most complex cave art sites: Mud Glyph and 1st Unnamed Caves have around 100 images each. As in Picture Cave, a single production technique dominates the parietal art in 12th Unnamed Cave, but here the images are petroglyphs engraved into the limestone walls of the cave's dark zone passages rather than painted pictographs. (If Picture Cave is America's Chauvet, then 12th Unnamed Cave is our Les Combarelles [Barriere 1997]). There are a few mud glyphs on the cave's ceiling, but these are spatially removed from the passages showing the most intensive decoration with petroglyphs.

There are numerous elements of subject matter that are similar in the two caves; some are relatively straightforward, and others are more subtle. Two image types, anthropomorphs and avimorphs, dominate the 12th Unnamed Cave glyph assemblage. Abstract signs and symbols are also numerous. As we will show in chapter 6, anthropomorphs dominate Picture Cave's art panels, and avimorphs and abstract signs are common. Serpents and segmented serpents occur in both caves. However, quadrupeds, an important theme in the Picture Cave assemblage, are rare at 12th Unnamed Cave.

In 12th Unnamed Cave, human effigies are of two types. The first is a fairly realistic representation of the human figure, always shown head to foot, sometimes face-on, sometimes in profile (figure 2.2). In a number of cases, elaborate headdresses are shown consisting of upwardly spread hair or feathers. In contrast to the contemporary images from Picture Cave, none of the 12th Unnamed Cave human effigies bear weapons or appear to be involved in combat. At least one, on the other hand, is phallic and is quite similar to male figures from Picture Cave. The other type of anthropomorphic figure in 12th Unnamed Cave is a less realistic depiction than those in the first group (figure 2.3). We call these "box people" because they combine an upright, two-legged morphology with an inhuman box-shaped torso, often filled with crosshatching or abstract designs. In some cases (figure 2.4), box people have serrated upper appendages, what we believe are wings, given the way that birds are illustrated in the cave, and in these cases, the head is shown as a small V. In other cases, box people have humanlike limbs. There are a few box people painted in Picture Cave (figure 2.5), although they are neither as frequent nor as variable as those in 12th Unnamed Cave.

Birds are depicted in both Picture Cave and 12th Unnamed Cave, and turkeys in particular are rendered in remarkably similar fashion (figure 2.6). As we shall see, cave art turkeys from this time period occur in several Tennessee sites in addition to 12th Unnamed Cave. In both caves, turkeys are shown

in profile, with emphasis on their long necks, fan-shaped tails, and three-toed feet. The engraved examples from 12th Unnamed Cave have more detail in the bodies and tails, with feather patterns clearly defined. All of the birds in 12th Unnamed Cave are shown on the wing, with their flight feathers visible. Only one image from Picture Cave, located in the small and rather distinctive Picture Cave 2, is shown in flight.

Figure 2.2. Representational anthropomorph petroglyph, 12th Unnamed Cave, Tennessee.

Figure 2.3. Box-shaped anthropomorph petroglyph, 12th Unnamed Cave, Tennessee.

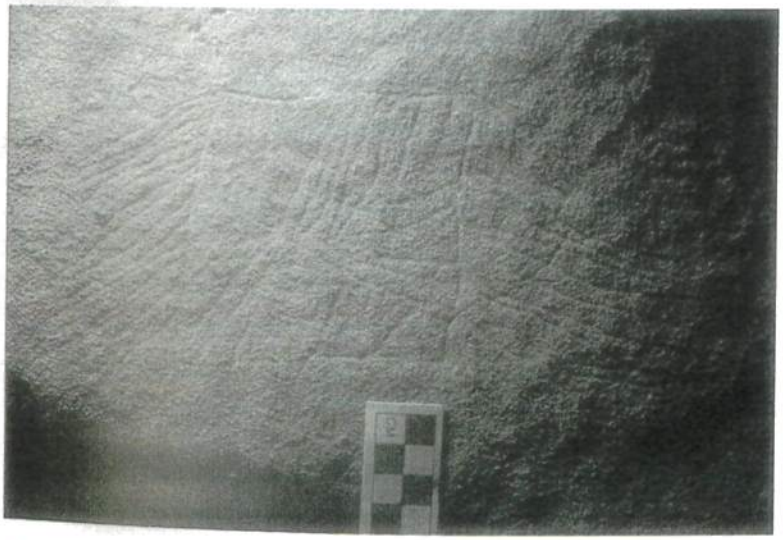

Figure 2.4. Serrated, or winged, box petroglyph, 12th Unnamed Cave, Tennessee.

There are a few more images from 12th Unnamed Cave that exemplify its similar imagery to that of Picture Cave. Both sites were burial sites, although looters have removed the human remains in both cases. As we have argued elsewhere, prehistoric burial sites were often "marked" with a distinctive sign we call a "toothy mouth" (Simek and Cressler 2010; Simek et al. 2004). This image appears in both caves, and in Picture Cave it occurs both in isolation and in face effigies (figure 2.7). One of the most impressive of these face effigies is a large serpent with antlers that has a toothy mouth in the very elaborate rendering of the face. An antlered rattlesnake, more than two meters long, is also engraved on the wall at 12th Unnamed Cave (figure 2.8). Other serpent motifs are present in both caves, including rather distinctive designs that represent serpents as groupings of delineated subcircular segments joined in series to form the limbless, reptilian body; no other caves that we

Figure 2.5. Box-shaped anthropomorph pictograph (Glyph 200), Picture Cave.

have seen contain similar images. Thus, while there are numerous differences in subject matter and execution between Picture Cave and the contemporary 12th Unnamed Cave, there are also a surprising number of similarities in these very complex and beautiful Late Woodland/Early Mississippian cave art sites.

11TH UNNAMED CAVE, TENNESSEE

11th Unnamed Cave in Tennessee was the subject of a 2001 *Southeastern Archaeology* paper (Simek, Faulkner et al. 2001). The cave contains a very complex archaeological record including twenty-two petroglyphs, pictographs, and mud glyphs; mass human ledge burials; and evidence for elaborate ceremonial activity on the cave floor below the parietal art. While the great majority of the nine carbon-14 age determinations from the cave correspond to the classic Mississippian period in the region (i.e., AD 1170–AD 1440), there are a few between AD 790 and AD 1170, indicating that the cave was used during the Early Mississippian (Simek, Faulkner et al. 2001:149). Several glyphs in the 11th Unnamed Cave assemblage are especially relevant to Picture Cave. One is a face effigy with a toothy mouth, again in association with cave burials (figure 2.9). Another group forms a panel of avimorphs and weapons, including a bird image with arms, a forked eye, and maces held in the hands (figure 2.10). This last image is reminiscent of a winged warrior vanquishing an enemy in Picture Cave (figure 2.11). We believe that the 11th Unnamed

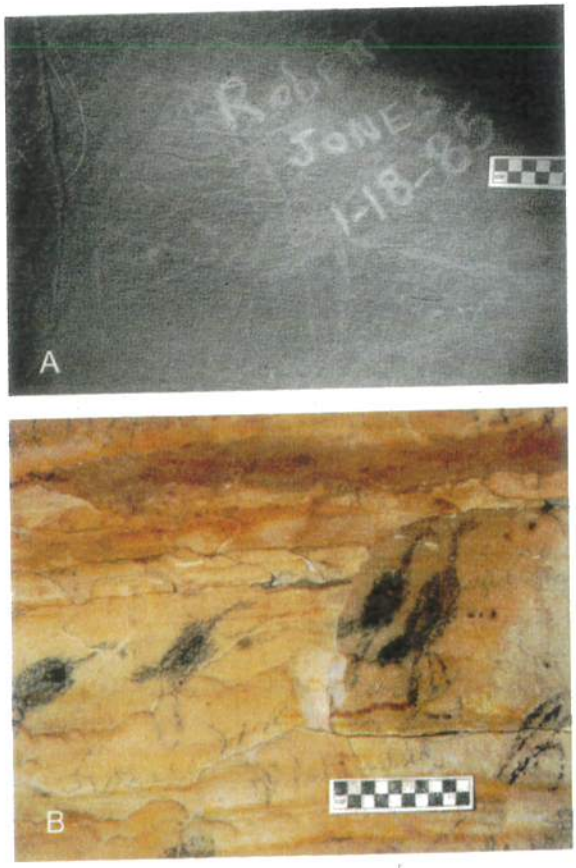

Figure 2.6. Turkey effigies in cave art: (a) flying turkey petroglyph, 12th Unnamed Cave, Tennessee; (b) landed turkey pictographs (Glyphs 056, 057, 140, 141), Picture Cave.

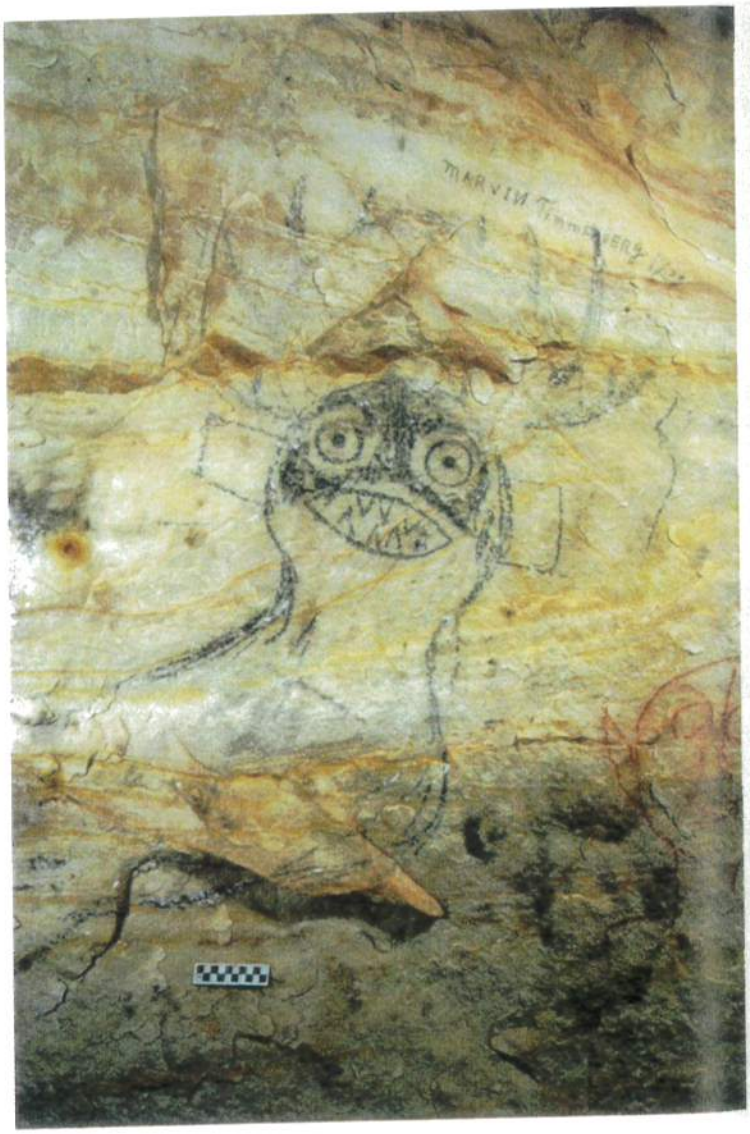

Figure 2.7. Large serpent pictograph with antlers and toothy mouth (Glyph 043), Picture Cave.

Figure 2.8.
Antlered rattlesnake petroglyph, 12th Unnamed Cave, Tennessee.

Cave art is somewhat later in time than that from Picture Cave, but the similarities in subject matter suggest continuity and development of artistic subject matter from the Woodland through the Mississippian, both inside and outside of caves.

One aspect of the 11th Unnamed Cave record is possibly quite important in trying to understand prehistoric utilization of Picture Cave, and that is the evidence for elaborate ceremony that the cave contains. Dense layering of river cane torch charcoal on the floor, stoke marks on the walls, implanted burnt river cane torch segments in the floor and on the walls—all suggest that the cave interior was brightly illuminated at times. In at least one case, a burning river cane was suspended from the cave ceiling in a mud ball pitched to stick to the limestone roof (Simek, Faulkner et al. 2001:149–150). There may have been many others, as over 350 mud balls were thrown up and stuck to the cave ceiling. A carbon-14 age determination on charcoal recovered from one of these mud balls demonstrates a Mississippian age for this activity (Simek, Faulkner et al. 2001:149–150).

The stratigraphic evidence suggests that activities involving this illumination occurred for only a short period of time in the Mississippian. Moreover, there is evidence for substantial clay mining and removal in the area of illumination and cave art production. And the observed presence of human burials, along with historical accounts of many bodies on the interior ledges of the cave (Simek, Faulkner et al. 2001:151), suggests that complex ceremonial activities were performed in the cave. Finally, spatial order and composition in the cave art adds further complexity to the events in 11th Unnamed Cave (Simek and Cressler 2008).

All of this points to the probability that complex prehistoric cave art sites like 11th Unnamed Cave and Picture Cave were scenes of important and elaborate religious behaviors that entailed human burial, art composition, and probably ritual activities associated with the sacred nature of the place and its transformation by prehistoric human utilization. Cave art sites were not simply art galleries; they were the location of active and profound devotion.

30TH UNNAMED CAVE, ALABAMA

30th Unnamed Cave is a small, very unpleasant stream passage cave in northeastern Alabama. Two age determinations calibrated to AD 945 and AD 1100 overlap entirely with the Picture Cave dates. Only one glyph is found in 30th Unnamed Cave, a

Figure 2.9. Face effigy petroglyph, 11th Unnamed Cave, Tennessee. Compare toothy mouth to that in figure 2.7.

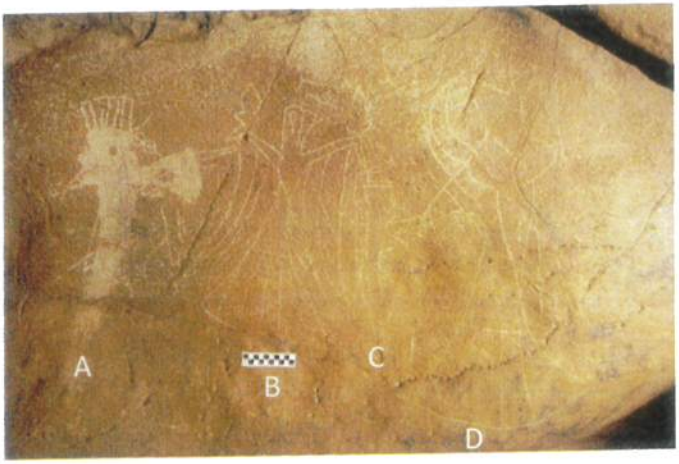

Figure 2.10. Panel of petroglyphs from 11th Unnamed Cave, Tennessee: (a) anthropomorphic head with axe blade in mouth; (b) upright bird with arms holding maces; (c) anthropomorphic head with axe blade in mouth; (d) mace with feathered tail.

Figure 2.11. Pictograph of anthropomorphic warrior with wings, holding maces aloft after vanquishing an enemy (Glyph 139), Picture Cave.

well-drawn charcoal pictograph of a mace (figure 2.12) quite similar to weapons depicted in Picture Cave 1. The isolated glyph is located at the end of several hundred meters of cold flowing stream that must be crawled to access the painting. 30th Unnamed Cave is an example of the many simple cave art sites we have documented in the Appalachian uplands (Simek and Cressler 2005).

31ST UNNAMED CAVE, TENNESSEE

31st Unnamed Cave is another rather simple cave art site located in the Nashville Basin of Tennessee. A single Late Woodland age determination from the site, when calibrated, indicates visitation at around AD 1100. There are two areas of cave art in 31st Unnamed Cave comprising a total of four images. Deep in the dark zone, fine-line petroglyphs were engraved into a low ceiling; these are abstract and not reminiscent of Picture Cave. Closer to the mouth of the cave is a fine black pictograph of a rattlesnake (figure 2.13), lacking antlers but otherwise quite detailed. This image is overlaid by a variety of graffiti, including some from the late nineteenth century. The cave's radiocarbon date was made on a piece of river cane charcoal recovered on the cave floor at the foot of this pictograph panel.

Figure 2.12. Black pictograph of mace, 30th Unnamed Cave, Alabama.

2ND UNNAMED CAVE, TENNESSEE

2nd Unnamed Cave in the Highland Rim geographic province of Tennessee has a single carbon-14 age determination that calibrates to around AD 1095. The cave contains ledge burials (without toothy mouth images) in association with a number of complicated mud glyph panels (Simek and Cressler 2001). These are abstract and overlapping in most cases, and little besides chronology relates this site to Picture Cave. It does indicate that all three prehistoric art production techniques were in use in Appalachia at the time that Picture Cave was created.

7TH UNNAMED CAVE, TENNESSEE

The final southeastern cave site that is contemporary with Picture Cave is Tennessee's 7th Unnamed Cave. A single calibrated carbon-14 date at AD 1105 is associated with multiple human burials, today badly looted, and more than thirty fine engravings on the walls. These engravings are quite beautiful and comprise an art assemblage dominated by turkey effigies shown with detailed body and tail features (figure 2.14a); well-known Mississippian icons like denticulated cross-in-circle motifs (figure 2.14b); a number of abstract signs such as filled boxes; rayed circles (or "suns"); and at least one toothy mouth. An interesting aspect of this assemblage is that the twenty or so turkey images systematically grow smaller from the back of the cave toward the entrance, from a maximum size around 30 centimeters long in the deep recesses to 2 centimeters at the exterior end of the array, as if they are viewed in perspective from the

Figure 2.13.
Black pictograph of rattlesnake, 31st Unnamed Cave, Tennessee.

interior outward. The deepest image at the site is of a bird/human transform with legs raised in a dancing pose (figure 2.15a) that recalls a number of painted animal/human dancers from Picture Cave (figure 2.15b); it may be this character whose perspective is expressed in the turkey size array. 7th Unnamed Cave is not far from 12th Unnamed Cave and was called Dancing Man Cave by Jean Allan, who was the first archaeologist to examine it. It is our impression (and only an impression) that of all the decorated caves in the Southeast, 12th Unnamed Cave and 7th Unnamed Cave are closest in style, subject matter, and execution; the same artists might well have produced them both.

A Wider View of Some Specific Motifs

We have considered those prehistoric cave art sites from the Appalachian Plateau region that are contemporary with Picture Cave according to available chronological data. The context of Picture Cave goes beyond its chronological position, however. Many of the subjects depicted in its artwork have antecedents in more ancient Woodland and Archaic prehistoric southeastern cave art, and, as other chapters in this volume show, Picture Cave imagery also has strong relationships to later prehistoric iconography, specifically that associated with the classic Mississippian period that flourished not long after Picture Cave and its Appalachian contemporaries were produced and used. In this comparative perspective, it is specific themes—motifs—that best exemplify these temporal and developmental relationships. We will briefly examine a few of the most common motifs at Picture Cave in broader chronological perspective, still concentrating on cave art, as that is the context we are trying to illustrate.

HUMANS AND OTHER ANTHROPOMORPHS

Human or humanlike figures appear very early in southeastern cave art; indeed, as discussed above, the earliest date of all—nearly 6,000 years old—is a direct carbon-14 age determination on an anthropomorphic pictograph from 48th Unnamed Cave in Tennessee. Woodland-period sites also contain detailed human images. A remarkable human face is depicted as a petroglyph in 13th Unnamed Cave,

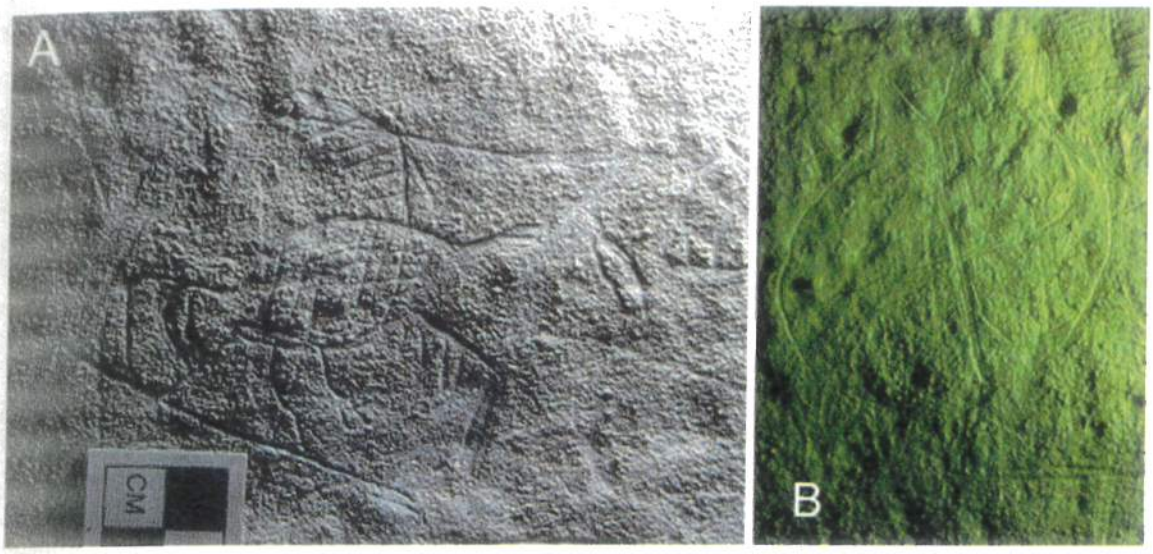

Figure 2.14. Petroglyphs from 7th Unnamed Cave, Tennessee: (a) turkey effigy; (b) cross-in-circle.

Figure 2.15. Dancing animal/human figures: (a) bird/human, 7th Unnamed Cave, Tennessee; (b) animal/human, Picture Cave (Glyph 092).

Tennessee (figure 2.16), and carbon-14 ages between AD 0 and AD 500 were obtained on associated cane charcoal. Crumps Cave in Kentucky has anthropomorphic mud glyphs with associated age determinations around AD 0. In 19th Unnamed Cave in Alabama, a number of anthropomorphs dating to around AD 300 are present, some reminiscent of human figures produced later in 12th Unnamed Cave (Cressler et al. 1999). But without doubt, the human images from the Mississippian period are the most elaborate and detailed, exemplified by several mud glyphs from Mud Glyph Cave (Faulkner [ed.] 1986; Faulkner and Simek 2001). Often, these late human cave art images are shown with ritual paraphernalia, as at 6th Unnamed Cave (Willey et al. 1988) and with regalia or clothing, as at Dunbar Cave (Simek et al. 2006, 2007, 2012) in Tennessee. In some cases, as at Mud Glyph, 11th Unnamed Cave, and 12th Unnamed Cave, anthropomorphs have animal characteristics such as wings or (at Dunbar Cave) claws on their feet (Simek et al. 2007, 2012). These are the characters that many archaeologists believe can be specifically identified as actors in ethnographically recorded myths; whether or not one subscribes to this identification, the fact of their detailed rendering is clear. The Picture Cave anthropomorphs are among the most detailed human images we have observed in any cave art site.

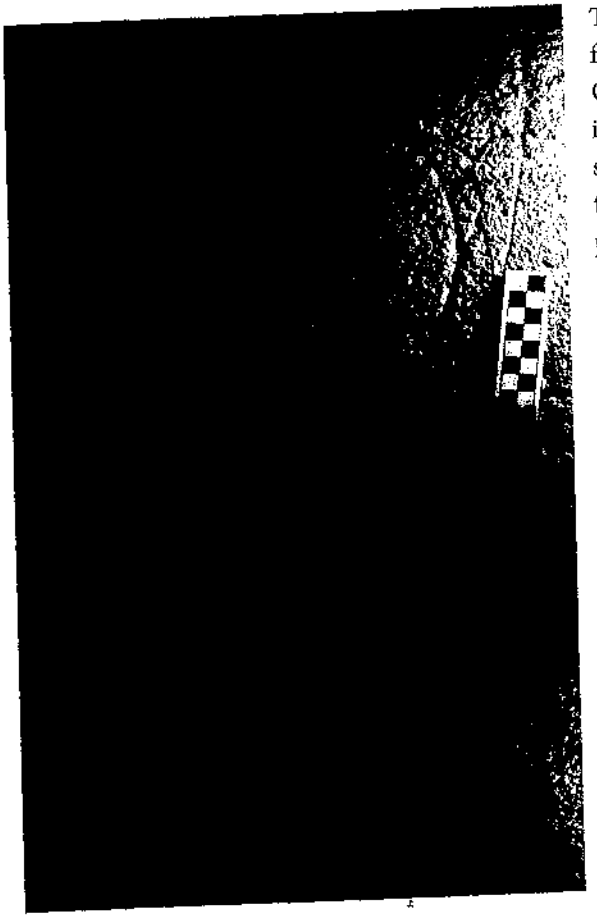

Figure 2.16. Face effigy, 13th Unnamed Cave, Tennessee.

WEAPONS

It is a curious fact that depictions of weapons, or images that might be reasonably interpreted as weapons, are very rare in southeastern cave art. More telling, with one exception, all such images date to late in the region's prehistory, that is, from the Early Mississippian until the end of the prehistoric sequence. The one exception to this Mississippian ascription for weapons depictions is, again, 48th Unnamed Cave; the anthropomorph in this earliest pictograph is holding a hunting weapon over his head, either a spear or an *atlatl*, pointed toward the quadruped that the man is pursuing. Here, the weapon seems to be a procurement tool rather than a weapon of war.

Between the 48th Unnamed Cave hunter image and the Early Mississippian mace from 30th Unnamed Cave described above, there are no images of weapons from southeastern caves. Specifically, there are no weapons shown anywhere in 12th Unnamed Cave, where over 300 individual glyphs and many human images are present. There are no weapons shown in 7th Unnamed Cave, although a bird/human transform creature is present.

In later southeastern cave art depictions, weapons are shown, and they have a less mundane context, rarely connected with the food quest and more commonly shown in unworldly situations. The maces shown in the hands of a bird in 11th Unnamed Cave are examples of this (Simek, Faulkner et al. 2001:145).

A very late (sixteenth century AD) human image in 1st Unnamed Cave has an axe at his waist (Simek

et al. 1997) as he interacts in a panel of mud glyphs with a large serpent (see figure 2.17). Another pictograph from 10th Unnamed Cave in Tennessee shows a human with a bow drawn and pointed at a bison (figure 2.18); as bison are late arrivals in the region, this pictograph is certainly late in the sequence (i.e., fifteenth century AD). Finally, a chronologically uncertain but most probably late petroglyph in 27th Unnamed Cave, Tennessee, shows a finely engraved bow and arrow with decoration on the bow itself.

Still, even late images of weaponry in southeastern cave art are uncommon when compared with other themes, like anthropomorphs and birds. Thus, from the point of view of its heavy emphasis on weaponry and warfare, Picture Cave is set apart from contemporary and antecedent southeastern cave art sites.

Figure 2.17. Anthropomorph mud glyph, 1st Unnamed Cave, Tennessee. There is an axe at the figure's waist.

Figure 2.18. Pictograph of hunter with bow and bison, 10th Unnamed Cave, Tennessee.

QUADRUPEDS

As is the case for weapons, quadrupeds are rare in prehistoric cave art sites east of the Mississippi River, even though they are quite common in Picture Cave (where they make up nearly 15 percent of the images). In Picture Cave, quadrupeds comprise both realistic and natural animals (bison and amphibians) and unnatural, probably mythological, creatures. East of the Mississippi, the nature of four-legged animals is less clear. The oldest is the deer pictograph in 48th Unnamed Cave, which has already been described. A very large mud glyph of a bear is among numerous images in 19th Unnamed Cave in Alabama (Cressler et al. 1999) associated with two calibrated Middle Woodland carbon-14 ages at AD 300 and AD 800. By the configuration of its head, this depiction is clearly an ursid (Cressler et al. 1999), but it is shown as a biped on its hind legs with a front limb raised; this may in fact be a mythical creature. Two quadrupeds that are not clear as to species are petroglyphs from 45th Unnamed Cave in Tennessee (figure 2.19). These animals have no antlers or horns and may be wearing equipment on their backs (Simek et al. 2006); they might represent dogs in harness. Turkey avimorphs, rendered like those in the nearby 7th, 12th and 38th Unnamed Caves (see below), and a serpent effigy are associated with these quadrupeds. The age of the 45th Unnamed Cave petroglyphs is uncertain.

Finally, a bison pictograph from 10th Unnamed Cave, the target of a hunter wielding a bow (see figure 2.18), is certainly late in the sequence, given that both the bow and the bison are associated with

Mississippian activities in the Southeast. There is no correlate to the frog image painted in Picture Cave, although there is a turtle effigy from Mud Glyph Cave that has a direct carbon-14 age (Simek and Cressler 2008).

Given the frequent depiction of birds and reptiles in southeastern cave art, the rarity of quadruped animals is surprising. Here, then, is another point of departure between the Picture Cave assemblage and the corpus of southeastern prehistoric cave imagery.

Figure 2.19. Quadruped petroglyphs, 45th Unnamed Cave, Tennessee.

Figure 2.20. Wasp mud glyph, 19th Unnamed Cave, Alabama.

BIRDS AND OTHER AVIMORPHS

This is a thematic area where southeastern caves exhibit an abundance of images while Picture Cave has relatively few. No fewer than ten southeastern caves have some sort of avimorph image, including two caves in Alabama (18th and 19th Unnamed Caves), one in Kentucky (Mammoth Cave), one in West Virginia (14th Unnamed Cave), and a number of caves in Tennessee. In a few cases, such as those already discussed from 11th and 12th Unnamed Caves, birds are the dominant subject; in other caves, single, sometimes abstract, images of creatures with wings are classified as avimorphs although they may not be birds. In some sites, human and bird images are combined into transformational creatures that blend characteristics of both. In other caves, birds are combined with fish or serpents. When the specific nature of birds can be identified, the images are most frequently turkeys, woodpeckers, or raptors. At least two heron effigies are known, and one bird with a long, thin beak from 12th Unnamed Cave may be a hummingbird. Frequently, although not uniquely, birds inside caves are depicted in flight, with their wings extended and flight feathers clearly delineated. This is in contrast to bird images from Mississippian contexts outside caves, which rarely show the animals on the wing. As already noted, the Picture Cave turkeys are on foot for the most part.

Flying insects, wasps or mud daubers (*Sceliphron* sp. or *Chalybion* sp.), are also depicted in southeastern caves, one in 19th Unnamed Cave, Alabama, and

Figure 2.21. Horned serpent mud glyph, 1st Unnamed Cave, Tennessee.

Figure 2.22. Petroglyph of creature with turkey's body and serpent's neck and head, 18th Unnamed Cave, Alabama. Note the large rattle at the tail end of the bird body.

another in 12th Unnamed Cave, Tennessee (figure 2.20). Both sites are Middle to late Woodland in age. No insects have been observed in the Picture Cave assemblage.

SERPENTS

The final motif we consider is the serpent, an impressive and integral element in Picture Cave, although not particularly numerous. There is a particularly fantastic image in Picture Cave of a very large serpent with antlers and a toothy mouth (see figure 2.7). In southeastern caves, serpent images are quite common, although they are also usually represented by only one or a few depictions in the sites where they are found. Serpents are certainly seen in at least eight art caves in the Southeast, including one cave dated to the Archaic period (Simek, Franklin, and Sherwood 1998) and two others (19th Unnamed Cave, Alabama, and Crumps Cave, Kentucky) dated to the Woodland period. Snakes occur as mud glyphs, petroglyphs, and pictographs and can be relatively small (15–20 centimeters) or very large (4 meters and incomplete at 28th Unnamed Cave, Tennessee, and 5 meters in length at 1st Unnamed Cave, Tennessee). As has been discussed, some serpents have head appendages, or horns, including examples from Mud Glyph, 12th Unnamed Cave, 8th Unnamed Cave, and a fine horned example from 1st Unnamed Cave (figure 2.21), all in Tennessee. In one instance, a transforming turkey has the body and long legs of a bird and the head of a serpent (figure 2.22), with an exaggerated rattle at the back of the bird body where the tail should be (Simek and Cressler 2008). Many caves in the Southeast, especially mud glyph caves, have masses of meandering lines traced through their interiors that may form serpent effigies lacking detailed head and tail elements. Whenever specific identifications are possible, vipers are clearly indicated by triangular heads and/or rattles on the tails.

Thus, many of the motifs that compose the Picture Cave art assemblage are subjects that appear in southeastern cave art as well. However, some

elements (weapons, quadruped animals) are more common in Picture Cave than they are east of the Mississippi while other elements (e.g., birds) are more common to the east although present in Picture Cave. Human figures are common in both areas, and transformational creatures (bird/humans, serpents with antlers) also are shown in both regions. All of this suggests that Picture Cave is part of a wider Eastern Woodlands cave art tradition that has its origins in the Archaic period, probably in the Appalachian karst; still, it represents a distinctive western expression of this tradition, one that may reflect its own local conventions and traditions as well as the broader regional characteristics. This is not surprising, given the specific nature of many of the individual depictions in Picture Cave, such as its emphasis on conflict and war, characteristics unknown in caves to the east.

Spatial Order in Southeastern Cave Art

Finally, we consider an aspect of composition in prehistoric cave art that we have observed in southeastern caves (Simek and Cressler 2008) and that, as we will show in chapter 6, is present in Picture Cave. One of the analytical techniques we have applied to the study of southeastern prehistoric art caves is a recording approach that seeks to identify spatial patterning in the distribution of images within a cave, that is, composition on a site-wide scale. This approach was pioneered by European analysts trying to understand the complexities of Paleolithic cave art (Aujoulat 2004; Breuil 1979; Leroi-Gourhan 1971), where there were no ethnographic records to influence interpretation. In many of the caves we have documented, we map the glyph arrays in detail and then examine these spatial data for patterning, and we brought this approach to Picture Cave (see chapter 6).

So, are there any regularities in Mississippian cave art compositions, and if there are, what are they? We suggest that there are indeed some basic patterns that appear in those caves we have considered, although these may be situation-dependent (conditioned by the spaces in which they were produced) and may vary in the details of their expression. Figure 2.23 shows four simplified models for cave organizations that we have extracted from our spatial and iconographic data. In all cases, birds (specifically, turkeys and woodpeckers) are found closest to the cave entrance. In two cases, the same animal is also the furthest from the entrance, as if to "frame" the array. In the sites where birds are not the deepest images found, it is a weapon and a human/avian mixture that form the inner boundary. Within these frames, weapons (often transformational), nonfood animals, mythical monsters, and transformational animals/humans occur in that general order as one passes into the cave interior. In short, a creature from the sky begins each cave's assemblage and ends all but one of them. The imagery becomes stranger, transformational, perhaps more dangerous, maybe even transcendental in Kant's sense, but certainly more ambiguous with distance from the surface. This model for cave composition can be used to deduce implications that must be tested against other cave art sites before it can be considered a general formula. However, we must admit our own surprise at the consistency with which these patterns agree, despite the wide geographic and, to a lesser extent, chronological dispersal of the sites we have considered.

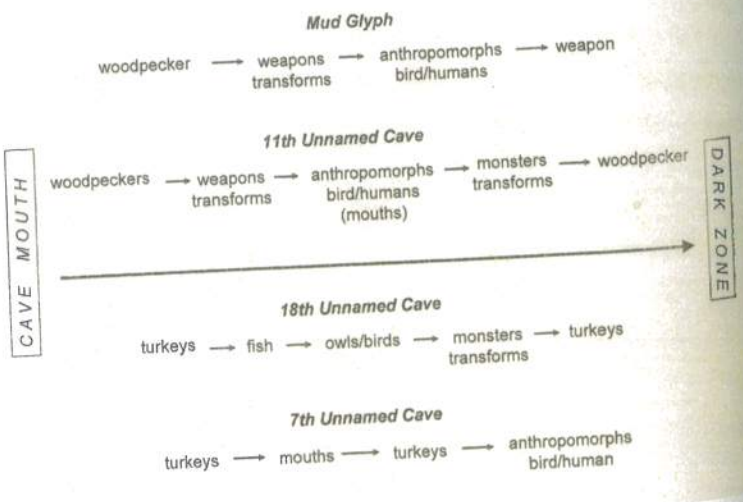

Figure 2.23. Simplified models for cave art spatial organization, four cave art sites in Tennessee and Alabama (after Simek and Cressler 2008).

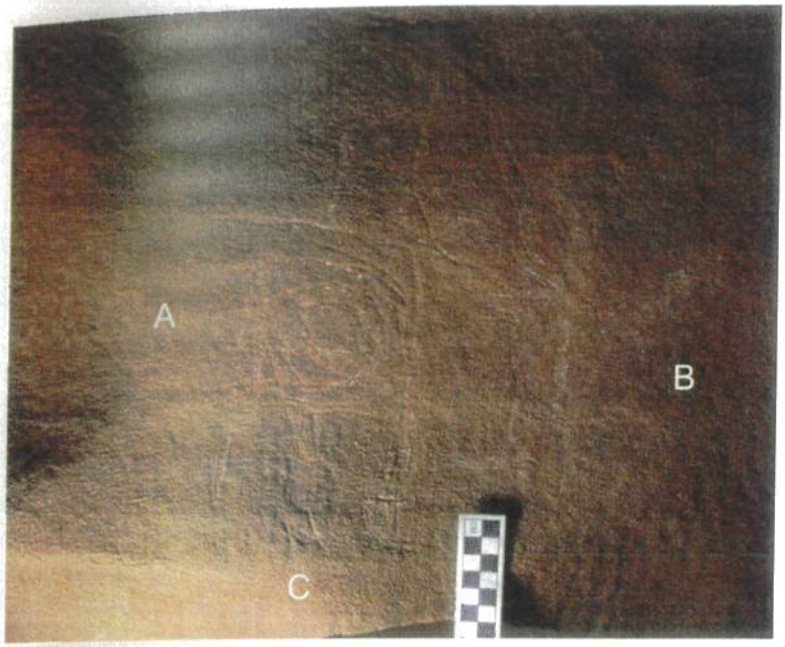

Figure 2.24. Petroglyph panel: (a) human figure; (b) box-human figure; and (c) infant figure between the box-human's legs, 12th Unnamed Cave, Tennessee.

Conclusions

A few final and more general observations are in order. One of the more interesting aspects of prehistoric cave art in the Southeast is the artists' apparent attention to composition. This composition, manifested as spatial order in images with differing subject matter, can be seen at several levels. In 12th Unnamed Cave, a particular group of characters—a box person and a human interacting with each other—is depicted repeatedly in panel format. Sometimes, the interaction includes an object, seemingly a textile, but in one case, the box person is giving birth to a human child (figure 2.24). In Picture Cave, repeated interaction between humans and quadrupeds characterizes painted panels in both Picture Cave 1 and 2. A second level of composition occurs cave-wide. Later Mississippian caves, those dating to after AD 1200, show a rather clear pattern in how different elements are disposed from the mouth of the cave into the lower reaches of the dark zone. In earlier caves, like 12th Unnamed Cave, the pattern is less clear, but it does appear that a progression holds from depictions of more worldly matters toward the mouth of the cave to more supernatural images in the deep. As we shall see, Picture Cave conforms to this model.

This reinforces the argument that Picture Cave is not an idiosyncratic cave art site in Central Missouri but part of a wider prehistoric tradition of cave art production and use that has its origins in the Archaic, probably in the Appalachian uplands, developed over the course of the Woodland period and reaching an apogee during the Mississippian period. By the Late Woodland, cave art sites like Picture Cave were transcendental compositions, charting pathways from the exterior world into the underworld and describing that passage in graphic form. This, along with other evidence found in the caves, strongly suggests that decorated caves were ceremonial precincts every bit as important as mounds and plazas. Understanding prehistoric religious activities in the Eastern Woodlands, therefore, requires integration of cave art like that in Picture Cave into more complete evolutionary and behavioral models for ancient belief systems.

Acknowledgments

Without the invitation, support, encouragement, and patience of Carol Diaz-Granados and Jim Duncan, the University of Tennessee work at Picture Cave, and this attempt to examine its place in the wider context of southeastern cave art, would not have been possible. The owner of the cave was a pleasure to meet and a joy to work with; the Tennessee group was greatly impressed with his toughness during our time in his cave.

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CHAPTER 3

The Geology and Ecology of Picture Cave

Philip W. Newell

THIS CHAPTER describes the physical context associated with Picture Cave. The physical context has major implications for archaeological study: the site is at the confluence of biomes creating microclimates that would have drawn the attention of early visitors; the uniqueness of the site creates a human perception of a special mystique; the site meets well the human priorities for shelter, water, and food; the white vertical sandstone walls in amphitheater/gallery rooms are ideal for presenting and preserving artwork; the sandstone has other uses; the cave is a source of iron nodules and guano, which can be used to make pigments; the flora and fauna have importance to archaeological research.

The physical context of the Picture Cave site is a primary determinant of how the site was used. It also has implications for the preservation and recovery of archaeological material. This discussion will proceed from general features to specific ones.

Physical context includes the geologic, climatic, and biologic features. These features combine to form a *natural community*, a group of organisms living together under a preferred set of conditions. One of the primary determinants of a natural community is geology. Geology directly determines both topography and soil. Through these, geology influences the flora and fauna that can be supported. The geology of the Picture Cave site has been generally stable over the duration of human presence. Geologic implications will be revealed as the discussion of natural communities becomes more specific.

The site's situation in the North American continent has implications regarding climate. The site is within the Northern Temperate Zone (latitude between 23.5 and 66.5 degrees). At this latitude, the winds are predominantly from the west, which, combined with the Rocky Mountains, causes a drier triangular area extending from the mountains to approximately Illinois. The site is at the boundary of this triangle, which includes northern Missouri. There was some variation in mean temperature over the duration of human presence. However, the

climate would have been relatively similar. The North American setting also has implications for the timing of both human migrations and settlement.

Some of the flora and fauna that have been observed at the site are mentioned in this chapter. It is assumed that these were present when early visitation occurred. However, changes to biology have occurred since European settlement of the area. It is generally understood that biodiversity has diminished.

The largest example of a natural community is a *biome*, a broad geographical area dominated by a similar set of climatic conditions and natural history. The site is at the confluence of five primary North American biomes (Hawker 1992): Western Prairies and Grasslands; Northern Boreal or Evergreen Forest; Eastern Temperate Deciduous Forests; Southwestern Deserts; and Southern Gulf Coast Swamps and Forests. The blending of these biomes enables unusually high floral and faunal species diversity. Similarly, there are implications for the blending of cultures that are adapted to the various biomes.

The site lies at the furthest southern extent of glaciations. *Glacial erratics*, rocks from other regions, in this case, northern ones that were carried to the area by the glaciers, are often observed by hikers. Since the erratics are unusual for the region, they add to the area's uniqueness and humans' perception of mystique.

Natural communities are usually classified at a smaller scale than biomes. Missouri is often divided into six major natural divisions: Glaciated Plains; Osage Plains; Ozark Border; Big Rivers; Ozark; and Mississippi Lowlands. The Picture Cave site is along a river within the Ozark Border. In a more specific classification, Nelson (1987) presents eighty-nine natural communities. This classification is used in describing not only the site, but also the cave and nearby shelter spring specifically.

Just as the proximity to the river was an advantage in finding the cave, it would be an advantage to those camping at the site. Inhabitants could use the river to obtain fish, mussels, fowl, other game, and plants. (Prior to the mid-1960s, my father commercially fished in the nearby Missouri River. He placed hoop nets downstream of the sandbars in the evening, and at sunrise, he would frequently harvest over 100 pounds of fish per net.) Before the Corps of Engineers improved the channel, the river was braided with countless sandbars, so fishing could have provided not only sustenance, but also wealth for trade.

It is natural to use game trails to ease travel through dense forest vegetation. Because of the nearby shelter spring, game trails pass near the cave. Currently, there is a deeply worn game trail that passes within 100 feet of Picture Cave. It could have been there for ages. The spring serves as a year-round source of water, and its shelter walls also serve as a mineral lick for game such as deer. People gathering and hunting in the area are likely to have encountered the spring.

The spring forms a *microclimate*, an area that offers living conditions different from those of nearby surroundings due to structure. The emergent water is close to the mean average temperature of the area; therefore, the conditions in and along the stream near the spring are particularly stable. The flora and fauna are buffered from climatic extremes. The rich flora attracts fauna, especially herbivores such as deer, and has an extended growing season. Along the stream, the flora becomes green earlier and remains so later than that in the surrounding area, making it especially attractive.

At the site, the mean average temperature is approximately 56 degrees Fahrenheit, and the mean annual precipitation is approximately 36 inches. However, the climate is seasonal and mid-continental; therefore, there is considerable variation from the averages. For example, the temperature can vary from below 0 degrees Fahrenheit to perhaps 100 degrees Fahrenheit. There is snow cover at times in the winter and hot dry periods in the summer. This variation excludes species which could survive the averages but not the extremes. This climate is one of the determining factors for the plants and animals that can inhabit the region. A microclimate which presents different species is unique and recognized as special by humans.

The benefits of the spring are multiplied because the surrounding area is particularly dry due to the sandstone bedrock's being permeable to water. The site is within a natural community classified as a *dry sandstone upland forest* (Nelson 1987). Forests are characterized by tree canopy cover of at least 50 percent; a variable understory of smaller trees and shrubs; and a ground cover of herbs, lichen, and mosses. Upland forests (vs. bottomland or flatwoods) are characterized by sloping and steeply sloping topography. The soil is shallow, with both the underlying sandstone bedrock and some chert often exposed.

The most dramatic change to the site's biology resulted from the cutting of the forest. We do not know the exact composition before the deforestation; however, the current trees may give a clue. There would have been some regrowth from existing seeds and stumps, with the faster growing trees having an advantage. Some of the trees and plants with native uses observed in the general area include the following (King 1984):

- Sassafras (*Sassafras albidum*) are very common around the sites. Their special nature is clear as soon as you break a twig. They have an obvious pleasant aroma and were used in various ways including as a medicine.
- Dittanies (*Cunila origanoides*) are also very common around the site. Merely walking through them releases a fragrant mint aroma. They too were used as a medicine. When there is a very hard freeze, one can observe at the site that dittany exudes flowerlike ribbons of ice from its base. These *frost flowers* add to the mystique of the site.
- Cedars (common red cedar, Juniperus virginiana).
- Hickories (shagbark: *Carya ovata*, shellbark: *Carya laciniosa*) are numerous on the hill above the site. The wealth of nuts serves as food and to attract and sustain game.
- Black walnuts (*Juglans nigra* L.), similarly, provide sustenance and attract game. It is easy to envision people sheltered at the site opening walnuts and hickory nuts and enjoying the meat.
- Oaks (*Quercus* sp.): acorns and the other nuts are a food source that can easily be stored and last into the winter.
- Pine trees are in the area but are the result of landowners planting 1,000 seedlings in the 1950s.
- The variety of mosses, lichens, and ferns are among the first plants to green up in the spring.

Many other plants observed at the site are edible, such as pussytoes (*Antennaria neglecta*), redbud (*Cercis canadensis* L.), and reindeer lichen (*Cladonia rangiferina*) (J. Phillips 1979).

Picture Cave is classified as a *dry cave* because it does not have permanent water (Nelson 1987). The lack of permanent water is due to the cave's position on the hill well above the water table and the fractured and permeable sandstone bedrock.

The cave area is the remains of a collapsed cave system. There could have been a much more extensive cave system at the site. At one time, the site included a bottomless pit (Missouri Speleological Survey, Inc., files); thus *speleogenesis* (cave formation) of the site is a topic for further research. There is speculation that nearby Devils Boot pit cave was formed by upwelling of mineral-laden thermal water heated by volcanic activity (Jerry Vineyard, state geologist, personal communication, 1990). Influences could be as far out as meteor impact. The Decaturville Structure near Camdenton, Missouri, was generally regarded as a volcanic crater until a shatter cone resulting from a meteor impact was found during a visit by a group including the author.

Shelter spring is classified as a *forested acid seep* (Nelson 1987). The water seeps through sandstone bedrock underlying the forest. There is no dolomite or limestone uphill. Thus the water is not calcareous from contact with dolomite or limestone. There is no soil at the spring, merely sand.

The shelter spring is particularly attractive to people for several reasons. The water seeps through sandstone, which has a filtering effect. Gathering and hunting there are attractive because the rich flora along the stream attracts game. Deer tracks are still abundant. The sandstone may be used as millstones and whetstones (Chapman 1975). There are metallic nodules with high iron content, which have been loosened from the sandstone bedrock by erosion. These nodules are considerably denser than typical rocks, so they may be used as weapons. Also, with weathering or artificial treatment, they can be used to make red and yellow pigment. These features identify the site as special and would have led the native peoples to investigate the surrounding area.

Native peoples visiting the spring are likely to have encountered the cave. The sunken area in front of the cave mouth inspires curiosity. The cave mouth also forms a microclimate, made noticeable by the richer, brighter green vegetation, such as liverworts, a variety of mosses and ferns in an area otherwise muted in color. This cave mouth microclimate and associated biology are different from most in the state because they were formed in sandstone rather than dolomite or limestone. During certain weather conditions, the high humidity in the cave would have caused a column of fog to flow from the mouth. Those investigating the mouth may also have noticed unusual fauna, including invertebrates such as terrestrial snails, large slugs, and, possibly, camel crickets (*Ceuthopilus* sp.) on the walls; amphibians such as slimy salamanders (common name of *Plethodon* sp.) usually hiding under stones; and birds such the eastern phoebe (*Sayornis phoebe*) which nest on cave mouth ledges. These creatures could not easily survive at this location were it not for the cave mouth. Those noticing the unusual flora and fauna would have recognized that the site was unique, considered it special, and become curious about what might be found inside.

Speleologists categorize the parts of caves into zones. Just inside the entrance of the cave is another microclimate known as the *twilight zone*, the area of the cave where light penetrating through the entrance is sufficient to permit human vision (Elliott 2001).

The camel crickets that native peoples might have observed at the entrance frequently come together in dense mats on the ceiling near the entrance. They go outside at night to forage and return during the day in clusters for safety. The camel cricket is an example of a trogloxene, an animal that habitually enters caves but must return periodically to the surface for certain living requirements such as food (Elliott 2001). Today we encounter several other trogloxenes in the twilight zone. On the ceiling in the winter is a moth with an orange pattern known as the herald moth or scalloped owlet moth (*Scoliopteryx libatrix*).

Several species of bats hang from the ceiling and may include: big brown (*Eptesicus fuscus*), eastern pipistrelle (*Pipistrellus subflavus*), Indiana (*Myotis sodalis*), and little brown (*Myotis lucifugus*). The bat guano could have been used as a pigment or body paint. Modern rouge and mascara owe their origins to bat guano. The red color of rouge results from completely decomposed bat guano.

The bats are conspicuous by their dense clustering—perhaps 300 to 400 bats per square foot. If these bats are the Indiana bats, which are protected by the 1973 U.S. Endangered Species Act, they may also indirectly provide protection to the rock art. There is a severe fine for disturbing them, and funding for additional security measures may be easier to obtain. Although we did not notice any on our trips, caves such as this frequently also contain mice and pack rats.

The twilight zone is easier and less risky for people to visit than the next zone: the dark zone. The dark zone is the portion of the cave where there is insufficient natural light to permit unaided human vision. It was practical to use a small fire (or cane torch) for illumination when creating and viewing artwork even in the deeper sections because smoke can escape higher up.

Although much of the cave may be too dark to create artwork with natural light, there is some light penetrating much farther than humans can practically use. In some areas of the cave, some light is perceptible after a long adjustment period. The significance of this light is the effect of fauna and flora on the artwork. There is evidence that foxes can see well enough to dig dens in lower sections, projecting dust onto all of the surfaces. Algae can impact patina; they require only miniscule light, either direct or reflected. Farther into the dark zone, the cave is used by creatures such as bats and salamanders. These too can impact the patina.

Picture Cave is formed in the St. Peter formation, a layer of typically quartzose sandstone whose grains are fine to medium, rounded, spherical, and frosted. Freshly exposed surfaces are commonly white with shades of pink and green. Weathered surfaces are brown or gray and may be locally case-hardened (Koenig 1961). The formation is approximately sixty to eighty feet thick, porous, permeable, and locally ripple marked. A particularly well preserved set of fossilized ripple marks from ancient shallow seas that is clearly visible on the ceiling between the entrance and the primary gallery of artwork adds to the mystique of the cave.

The sandstone at the site also contains metallic nodules with high iron content. Some uses for these nodules are discussed above. These nodules cause characteristic rust-colored staining. In some cases, the artwork is based in part on the pattern of the staining.

When blocks fracture off, they frequently leave vertical walls and flat ceilings. Some of the walls inside the cave retain their whiteness because they are protected from weathering. The vertical off-white walls are exceptionally convenient for artwork. The permeable sandstone has additional advantages over limestone or dolomite caves, which are much more common in Missouri. For example, water is less likely to erode the rock or leave calcite deposits (stalactites, stalagmites, draperies, dripstone, etc.) that obscure the artwork. The rooms containing the artwork are mostly shaped like amphitheatres or galleries, which allowed the viewer to walk near the artwork to explain it while an audience observed from convenient seating. In this context, the darkness could have been an advantage. The pictures were revealed only as they were illuminated. A storyteller could focus the attention of the audience on one portion of the gallery at a time. In discussions with speleologists across the state, none could think of another site with this combination of off-white sandstone walls and amphitheatre seating.

First use of the cave may have been motivated by the need to escape something life threatening or merely by curiosity. First, the cave is an effective hiding place from hostiles. It is defendable because of its limited entry points. In the large entrance rooms a group of defenders could concentrate their force on hostiles crawling through the small entryway. An individual could easily hide among breakdown boulders and crawlways. Individuals threatened with death would be more motivated to squeeze through crawlways than would pursuers, who would be concerned about being ambushed in a defenseless position, belly crawling like a salamander in total darkness. Pursuers could not see their quarry and could not effectively carry light into crawlways only big enough to permit passage.

Second, the cave could serve as protection from wild animals. The sandstone breakdown blocks form passageways that tend to be rectangular. The squeezeways are better protection for humans than those of the rounded solution caves. Humans, with their legs behind them and their arms at their sides, have the advantage in the low, wide squeezeways. Full-grown humans can traverse passages less than a foot high and use jabbing weapons. However, a large predator such as a bear, a cougar, or a wolf would have difficulty. If they were able to enter, they would likely be discouraged and decide to find easier prey.

Third, the cave also has served as shelter from the weather. Deep caves without significant through air

flow maintain a constant temperature. The temperature inside is approximately the mean annual temperature of the location. This protects anyone inside from the temperature extremes identified earlier. The cave could also have served as a shelter from high winds and hail.

The shelter value of the cave is increased by the fact that fires can be built inside, and the smoke will rise up and exit. People sheltering at the cave would have brought in and left many materials, adding stratigraphy. However, in the high-humidity environment, fungus would have had a major impact on organic materials.

The fauna also have implications for archaeological investigations. Some are obvious, such as digging by wild dogs. For example, foxes dig approximately three-foot dens to shelter pups. Other implications are not so obvious. Bats leave guano, adding to overburden, and urine stains on ceiling roosting sites; slugs leave slime on the walls and ceilings. Other creatures also make their mark. Some of the artwork is covered by a layer of these organic deposits. Over time, bacteria and fungus have operated on these deposits, changing them. Since these organic deposits are more recent than the artwork, they could skew the dates to appear more recent were it not for the fact that samples are decontaminated. The amount of skew would depend on the proportion of animal contribution to the proportion of pigment. If the pigment were very thin, the animal contribution could overwhelm, and the artwork could be twice as old as initially believed. This possibility warrants checking by repeating the tests using sections of wall containing no artwork and following the same decontamination procedure.

Because the bedrock is sandstone, the overburden accumulates extremely rapidly. One can see where people have thrown rocks, which broke, resulting in sand. Additional sand washes into the cave along with soil, leaves, and twigs. Material is brought in by animals, including bats; dogs, foxes, coyotes, and wolves; crickets, which go out at night to forage and leave waste inside; snails, which leave slime; phoebes, which may carry in mud and twigs to build two nests per year; and people. Pot hunters have dug less than 5 feet down; dogs have dug even less. So if only one inch of overburden accumulates each year, these scavengers have penetrated only 60 years' worth of fill. A more conservative accumulation figure gives proportional results: ½ inch per year—120 years; ¼ inch—240 years; ⅛ inch—480 years.

Summary

The physical context of the Picture Cave site has major implications for archaeological study. The site is at the confluence of biomes and cultures, and the microclimates would have drawn the attention of early visitors. The uniqueness of the site creates a human perception of special mystique, and the site meets well the human priorities for shelter, water, and food. The vertical sandstone walls in amphitheatre and gallery rooms are ideal for presenting and preserving artwork. The sandstone itself has other uses. The cave is a source of iron nodules and guano, which could have been used to make pigments. The flora and fauna have implications for additional research.

CHAPTER 4

Geochemical Analyses of Prehistoric Pigment Materials from Picture Cave

Sarah A. Blankenship

THIS CHAPTER discusses the results of the analyses performed on red and black pigments sampled from parietal prehistoric art at Picture Cave, Missouri. Characterization of the pigment materials was performed using scanning electron microscope–energy dispersive spectrometry (SEM-EDS) and electron microprobe (EMP) analyses. These techniques provided both microstructural information and the elemental composition of the pigments, which aided the identification of mineral crystalline phases along with other chemical constituents of the paint materials. Little is known concerning the technologies of prehistoric paint production in the Eastern Woodlands; thus, these analyses provide important information on the symbolic complexities of paints utilized by the late-prehistoric peoples at this significant cave art site.

Introduction

An important, and often overlooked, question in the study of prehistoric rock art is the nature of the pigment materials used to create pictographs (paintings or drawings). The scientific physical and chemical analyses of pigments provide important insight into the technologies of prehistoric color manufacture and application. In addition, they can give us information useful for defining the range of raw materials available on both a local and a regional scale. The application of electron microscopy, in particular, is a highly useful technique because it allows characterization of the chemical and structural components of pigments.

These types of physical and chemical analyses have proved useful in the study of rock art at both open-air and cave sites in France (e.g., Clottes et al. 1990), Australia (e.g., Cole and Watchman 1996), and the American Southwest (e.g., Labadie et al. 1997). As noted by Faulkner (1996:111), understanding "the meaning of this art (i.e., why it was produced) and its role in the rituals of the people who created it" is certainly a difficult task. Through the continued application of scientific and systematic studies of these sites,

the materials and techniques used to create this significant form of ritual and/or religious expression in the archaeological record can be better understood. However, this avenue of research has been largely ignored in rock art studies in the eastern United States.

As part of the Picture Cave Interdisciplinary Project, I was invited by Carol Diaz-Granados and James R. Duncan to conduct physical and chemical analyses of the pigments used to create the impressive array of images at the Picture Cave sites (Picture Caves 1 and 2). The methods of execution include line drawing in black, line and fill drawing in black, monochrome and bichrome painting in black and/or red, and, in one instance, abrading of the patinated sandstone to create a white graphic in conjunction with line drawing (figure 4.1). Pigment materials were sampled from pictographs representative of each method of execution and characterized using nondestructive SEM-EDS and EMP analysis. These techniques provided both microstructural information and elemental composition, which aided the identification of mineral crystalline phases and other geochemical constituents that might be present.

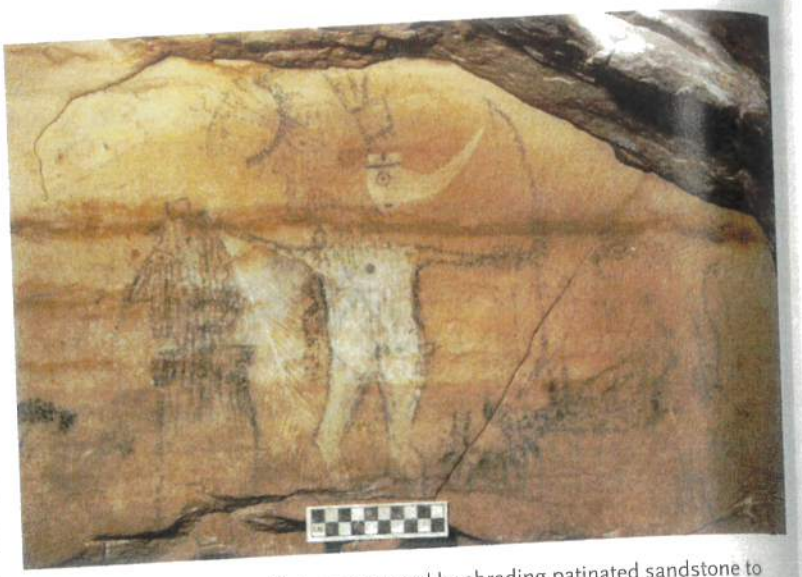

Figure 4.1. Anthropomorphic image created by abrading patinated sandstone to create white graphic in conjunction with a line drawing in black, Picture Cave 1.

Materials and Methods

Six pigment samples from black and red pictographs at Picture Cave 1 and 2 were analyzed in this study. Control samples of unmodified sandstone adjacent to each pictograph were also analyzed. Because sampling the pictographs was in itself destructive, microsamples of pigment were taken in order to minimize any surface damage. Each was removed with a sterile steel scalpel and placed in foil. Because the microsamples are too small for standard powder method, X-ray diffraction (XRD) analyses, the specific crystallographic phases within the pigments are not known at this time. However, the X-ray-based techniques applied in this study allowed the characterization of the chemical or geochemical form of the materials analyzed. Pigment materials from each of the six examined microsamples were isolated and their major elemental composition determined using

TABLE 4.1. Elemental composition of pigment samples and corresponding control samples from pictographs analyzed in this study

SAMPLE	COLOR	ENERGY DISPERSIVE SPECTROMETRY ELEMENTAL COMPOSITION*
PICTURE CAVE 2		
Anthropomorph with weaponry	Black	C (M), O (M), Al (m), Si (M), K (m), Fe (m)
Control		O (M), Si (M)
Chevron/zigzag	Red	C (M), O (M), Al (m), Si (M), Fe (m)
Control		O (M), Si (M)
PICTURE CAVE 1		
Quadruped	Black	C (M), O (M), Al (m), Si (m), P (m), S (m), Fe (m)
Control		C (M), O (M), Al (m), Si (M), K (m), Fe (m)
Abstract/linear motif	Red	O (M), Al (m), Si (M), Fe (M)
Control		O (M), Si (M)
Anthropomorph	Black	C (M), O (M), Al (m), Si (M), P (m), K (m), Fe (m)
Control		C (M), O (M), Al (m), Si (M), K (m), F (m), Ni (m)
Circle	Red	O (M), Al (m), Si (M), P (m), K (m), Ca (m), Fe (M)
Control		C (M), O (M), Mg (m), Al (m), Si (M), P (m), K (m), Ti (m), Fe (m)

Note: A major (M) or minor (m) level of each element is indicated.
*System resolution = 127eV. Quantitative method: ZAF (4–7 iterations). Analyzed all elements and normalized results.

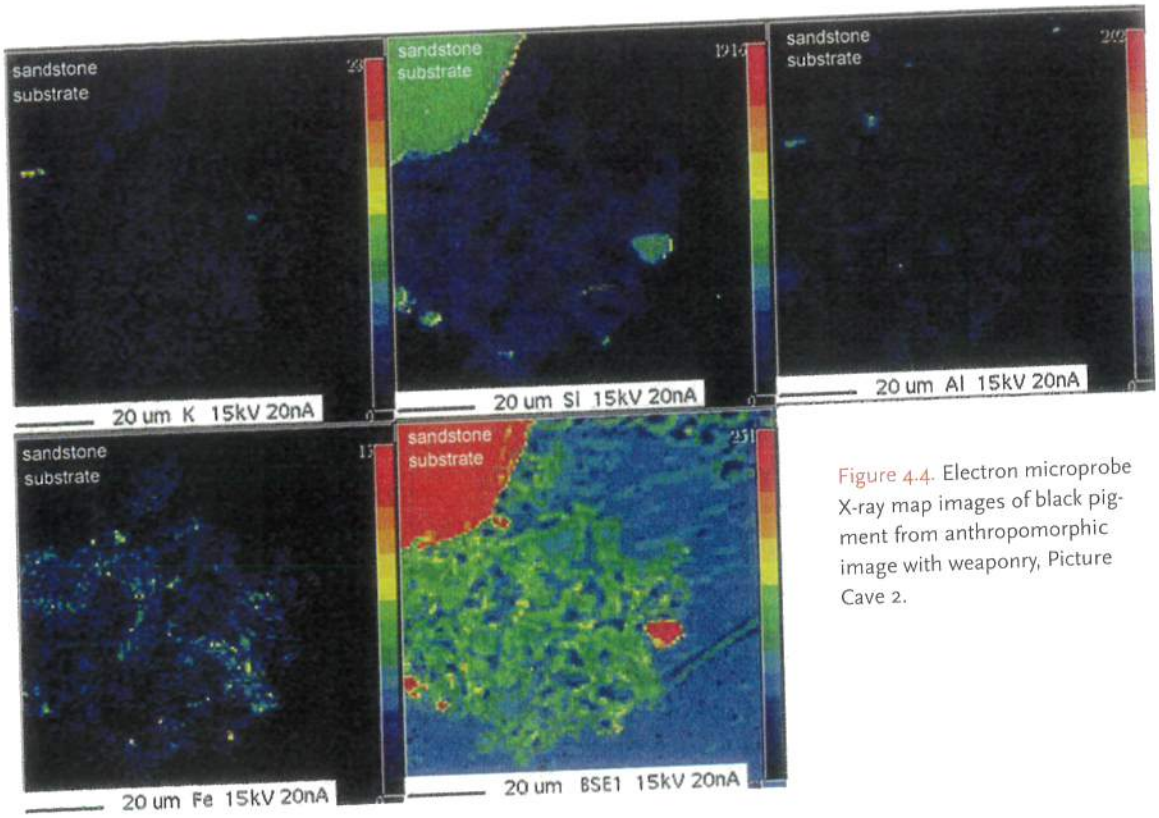

Figure 4.4. Electron microprobe X-ray map images of black pigment from anthropomorphic image with weaponry, Picture Cave 2.

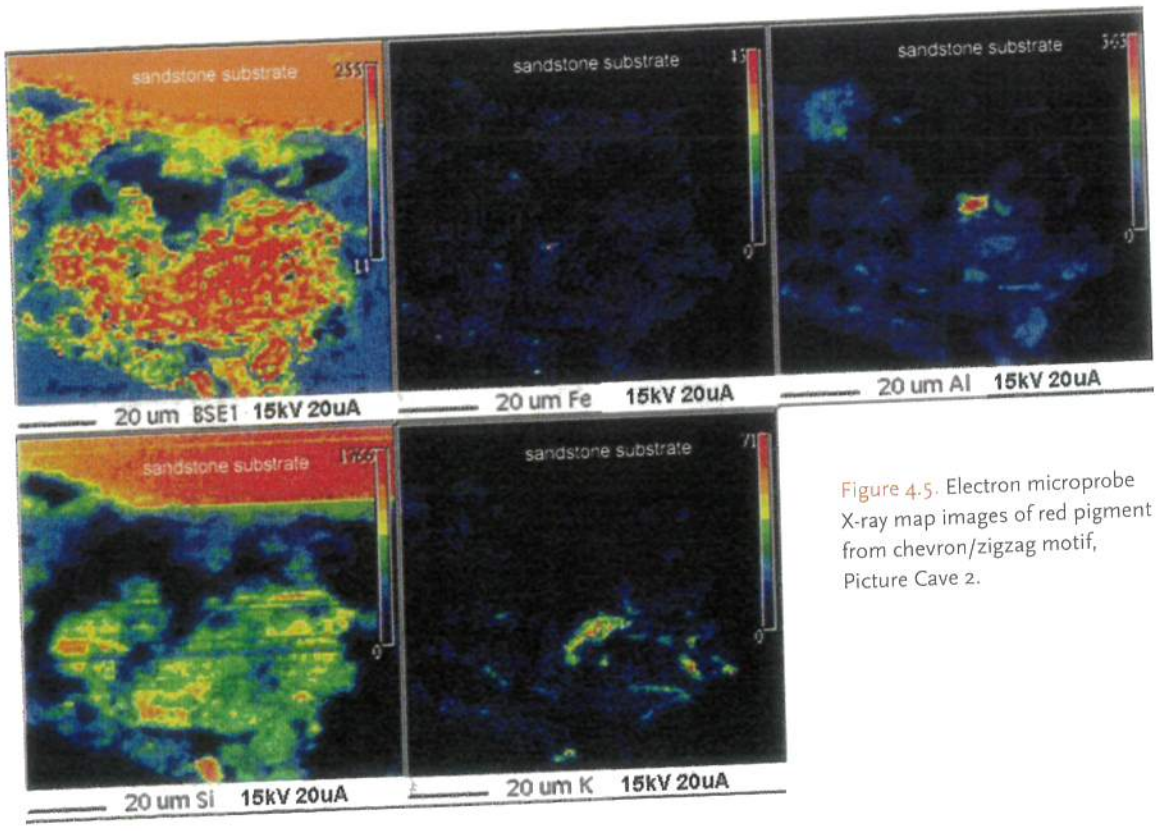

Figure 4.5. Electron microprobe X-ray map images of red pigment from chevron/zigzag motif, Picture Cave 2.

the dehydration of goethite by firing (Pomiès et al. 1999; Zoppi et al. 2002:302). Although the quantity of iron (Fe) detected by EDS in the sample, 0.72 percent, is small, it is sufficient to produce the coloration.

Black grains were also observed in this sample. In addition, EDS analysis identified carbon, 11.46 percent. Calcium and phosphorous, which are indicative of bone black, were not found; thus, the presence of charcoal is inferred. Finely ground charcoal may have been intentionally mixed with red ochre to give it a deeper shade or was used as filler. Conversely, its presence may be the result of contamination during pigment preparation.

PICTURE CAVE 1

Four samples were examined from pictographs at Picture Cave 1: black pigment from a quadruped graphic (figure 4.6); red pigment from an abstract/linear motif (figure 4.7); black pigment from an anthropomorph graphic (figure 4.8); and red pigment from a circle motif (figure 4.9).

Black pictograph: quadruped. EDS analysis of black pigment from this quadruped (see figure 4.6) at Picture Cave 1 identified a major quantity of carbon, 58.37 percent, along with minor impurities from the underlying sandstone. EMP analysis identified silicon (Si) from the quartz (SiO_2) sandstone substrate but did not detect elements constituting any other major mineral phases. The absence of calcium, phosphorus, and other major mineral phases suggests that charcoal, or vegetal carbon, is the sole chromophore. This particular graphic was executed in line and fill; thus, it is presumed that a charred piece of wood, a charcoal "pencil," so to speak, was used to render the pictograph.

Red pigment: abstract/linear motif. This red linear graphic appears to be part of an abstract composition consisting of three lines and a concentric circle motif (see figure 4.7). Based on the results of EDS and EMP analyses, hematite was determined to be the primary component of the red pigment. EDS revealed major iron, 14.06 percent, indicating the presence of iron oxide. The dark-red coloration of the pigment suggests that it is the anhydrous form,

Top. Figure 4.6. Quadruped image rendered using a charcoal "pencil," Picture Cave 1.

Bottom. Figure 4.7. Abstract/linear motif rendered in red pigment, Picture Cave 1.

Figure 4.8. Anthropomorphic image rendered in black paint, Picture Cave 1.

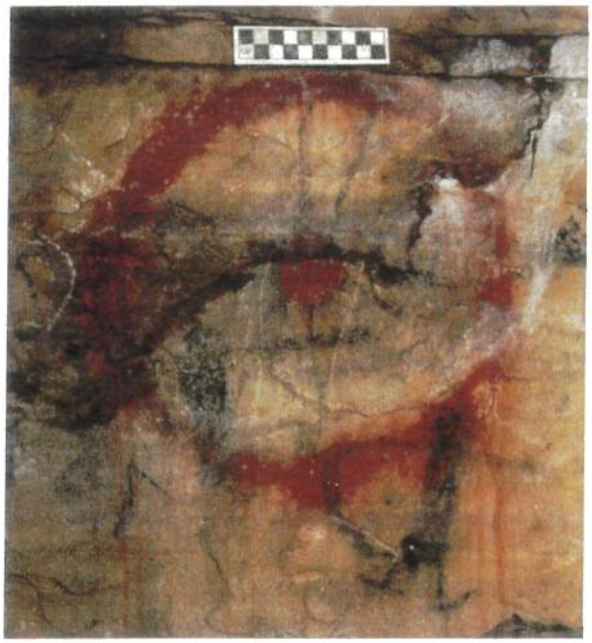

Figure 4.9. Circle motif rendered in red paint, Picture Cave 1. Note the drip lines at the lower portion of the pictograph, which indicate that the paint was applied to the sandstone wall as a thin, wet slurry.

hematite (Fe_2O_3). A major quantity of silicon (Si), 20.67 percent, and minor aluminum (Al) form the main chemical compositions of quartz (SiO_2) and aluminum silicates that are frequently found to be associated with iron oxides such as hematite. The concentrations of these elements throughout the sample can be observed in the EMP X-ray map images (figure 4.10).

Black pigment: anthropomorph. The anthropomorph figure from Picture Cave 1, shown in figure 4.8, differs from the black pictographs discussed thus far in that it is finely executed in black paint, or stain, rather than line and fill. Similar to the other black pigments examined, however, EDS analysis of this sample identified carbon, 37.83 percent, to be the major elemental constituent of the pigment. Calcium phosphate from bone carbon was not detected in the sample; therefore, it is presumed to be vegetal carbon. Silicon, aluminum, and small percentages of potassium and iron were also identified. The EMP X-ray map images (figure 4.11) show an association among these elements and can be attributed to an iron-bearing clay or ochre. Also identified in the pigment material was an aluminum phosphate mineral, demonstrable in the X-ray map images (see figure 4.11) as a co-occurrence of aluminum (Al) and phosphorus (P). Whether this mineral was an intentional additive to the paint mixture or a naturally occurring component of the clay source material is not known. Nonetheless, the chemical composition of this paint is significantly different from that of the other black pigments.

Red pigment: circle motif. The EMP elemental mapping of red pigment from this circle motif (see figure 4.9) at Picture Cave 1 provides a clear picture of iron (Fe)-rich red paint mixed with clay and, like the aforementioned black paint, aluminum phosphate (figure 4.12). EDS analysis detected a major elemental percentage of iron (20.95) and oxygen, undoubtedly hematite (Fe_2O_3), which is the highest concentration of iron oxide found in this study. It appears that the paint was applied to the sandstone wall as a thin, wet slurry, evident by the drip lines toward the lower portion of the pictograph (see figure 4.9).

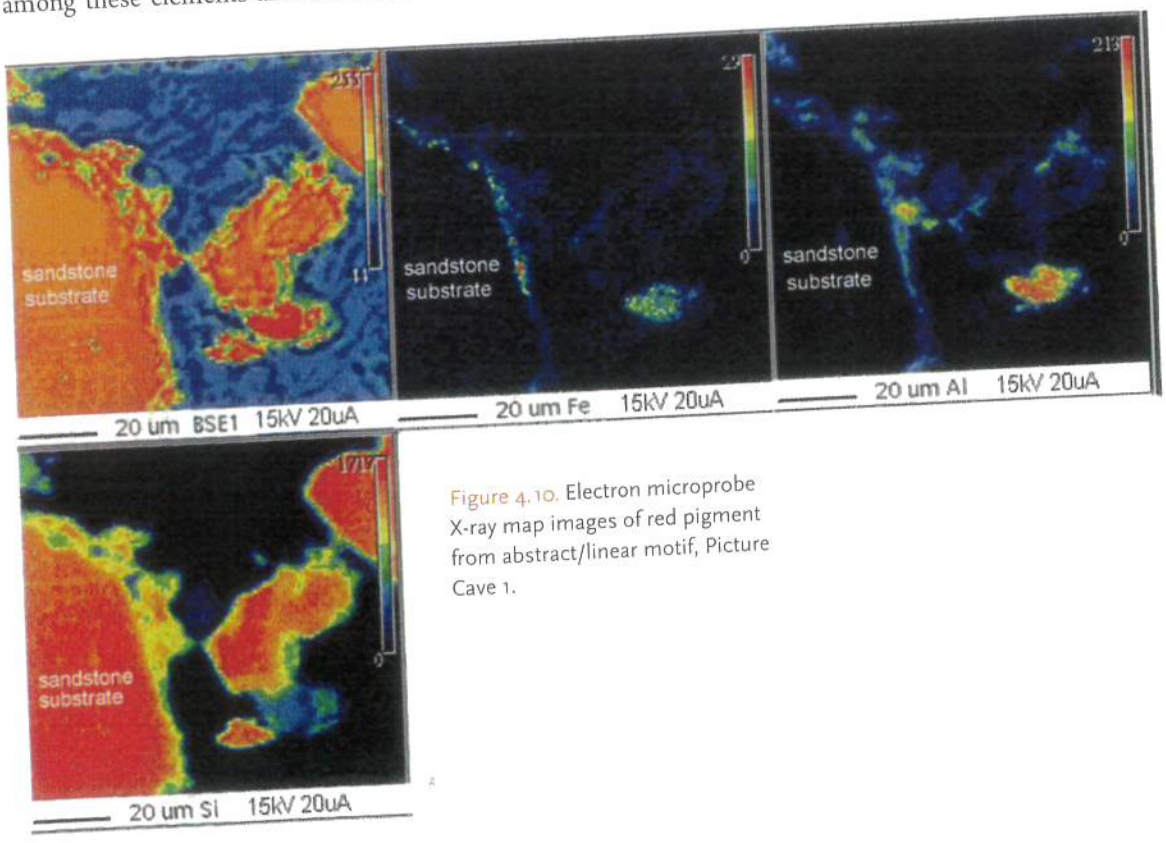

Figure 4.10. Electron microprobe X-ray map images of red pigment from abstract/linear motif, Picture Cave 1.

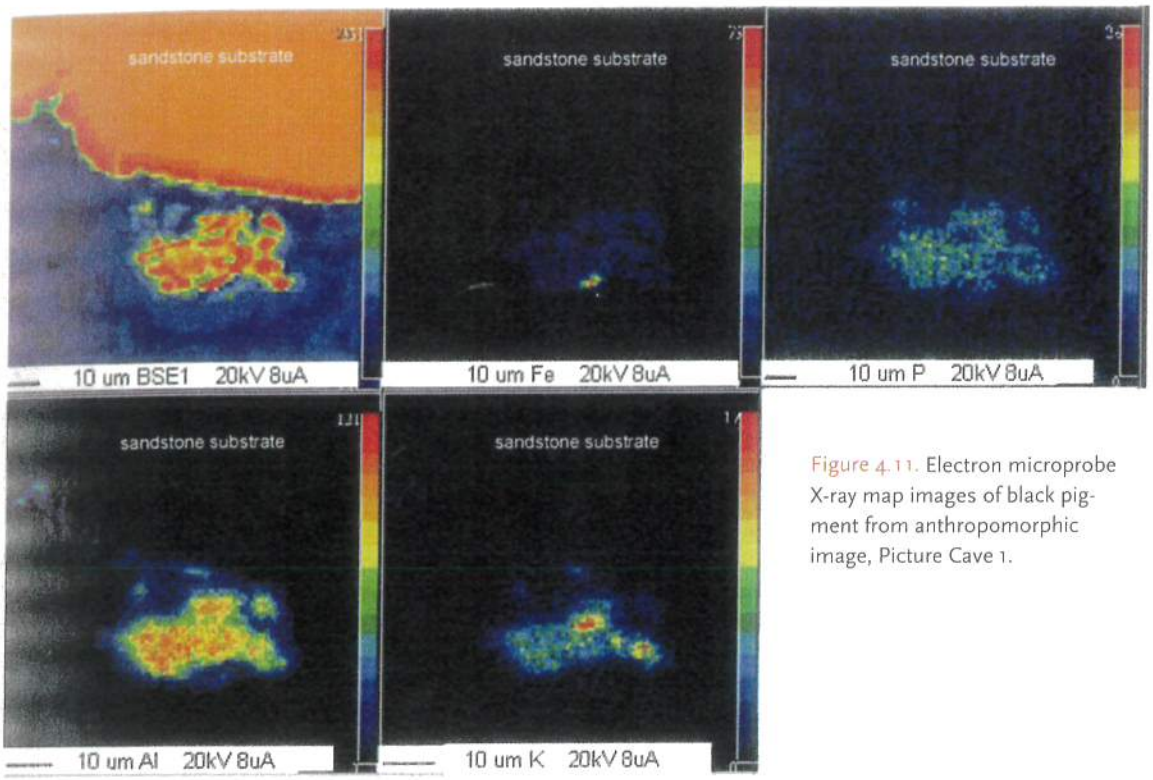

Figure 4.11. Electron microprobe X-ray map images of black pigment from anthropomorphic image, Picture Cave 1.

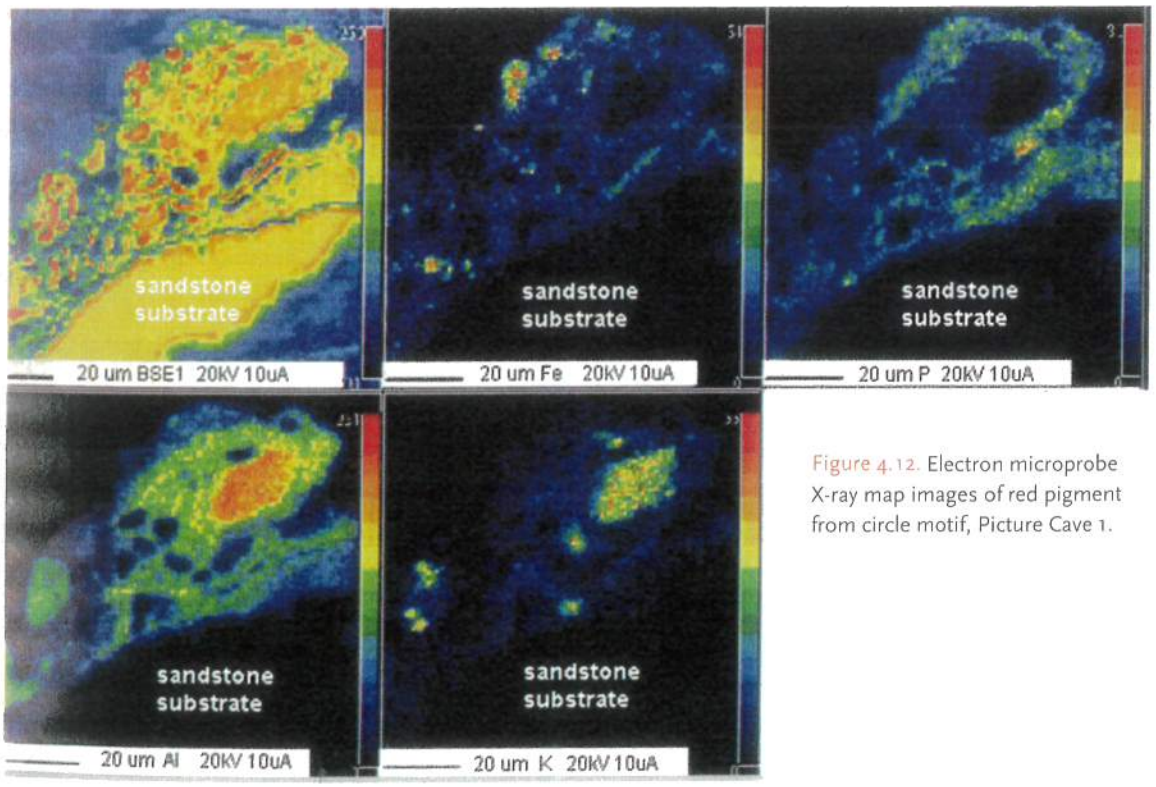

Figure 4.12. Electron microprobe X-ray map images of red pigment from circle motif, Picture Cave 1.

Discussion and Conclusions

At both Picture Cave 1 and 2, black coloration, although achievable with iron (e.g., magnetite, Fe_3O_4) and manganese (e.g., manganese dioxide, MnO_2) minerals, was clearly derived from organic (vegetal) carbon. Burned wood, or charcoal, is concluded to be the origin of the organic carbon. Charcoal was applied directly to the sandstone wall with a "pencil," or, as in the case of the paintings, was mixed with clay prior to its application. The charcoal pigment may have been obtained on-site from torches or fires used as a light source within the cave. In the karst regions of Tennessee, Alabama, Kentucky, and Georgia, river cane (*Arundinaria* sp.) torches were commonly used by prehistoric cavers. River cane, however, has not been found at the Picture Cave site.

Ethnographic information concerning pigment production among the Osage, Missouri's earliest known occupants, shows that "black color for the face was [obtained] by burning a quantity of willows. When these were charred they were broken in small pieces and placed in pans, with a little water in each" (Mallery 1972 [1893]:221). Bailey (2004:60–62) notes that charcoal was considered a sacred component in the Charcoal Dance, or War Ritual, of the Osage: "In the Earth and Sky Houses, the sacred charcoal was prepared and the two sacred war standards constructed. Priests of the Bear (Earth) and Night (Sky) clans prepared the sacred charcoal from branches of redbud or willow trees, both considered sacred and symbolic of long life. . . . On the third day, each warrior was given a bag of charcoal . . . the warriors prepared themselves by painting their faces black with charcoal."

The red paints were produced from an iron-oxide mineral, likely hematite (Fe_2O_3), and an iron-rich ochre or clay. Similarly to the black paint recipe, clay, either as a naturally occurring component (ochre) or intentionally mixed with ground hematite, might have served as a binder.

Hematite and red ochre are ubiquitous throughout the Missouri region. Extensive hematite deposits occur in the St. Francois Mountains of southeastern Missouri (see Emerson and Hughes 2000:92; Kisvarsanyi 1981). Prehistoric hematite mines are said to have been encountered by early miners in this region (Emerson and Hughes 2000:92). Furthermore, Emerson and Hughes (2000) suggest that local exotics, such as hematite, flint clay, quartz, and galena, found at American Bottom Mississippian sites, may have originated from the Ozark Highlands of Southeast Missouri.

The presence of aluminum phosphate in red and black pigments at Picture Cave 1 is also interesting. It is possible that an aluminum phosphate mineral was added to the paint mixtures. Conversely, clays were apparently added to these recipes as well; thus, clay may be present as an impurity from the clay source. Regardless, I have never seen aluminum phosphate reported in pigment studies.

This research is the first scientific study of prehistoric pigments in Missouri and, I believe, is an important contribution to the ongoing interdisciplinary study of the Picture Cave site. There is certainly more work to be done. The results of this initial study, nonetheless, demonstrate that the materials and techniques used prehistorically at the Picture Cave sites are quite varied and range from line drawings applied with a charcoal "pencil" to finely executed paintings made with specific paint "recipes." The pigments contain locally available mineral and organic constituents as chromophores or binding agents. Furthermore, the pigments and clays were likely mixed with a liquid vehicle, perhaps water, which allowed the pigment to spread easily on the basal sandstone. In addition, the variation in pigment composition throughout the site may indicate idiosyncratic mixtures by different people, temporal differences, or symbolic/ritualistic differences.

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